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The Snakes of Ceylon

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ABSTRACT: The report is based primarily on the Ceylonese snakes in the collection of the United States National Museum, and those in the Edward H. Taylor-Hobart M. Smith collection at Lawrence, Kansas. The paper also includes a few specimens recently received in exchange from Dr. W. C. Osman-Hill and now in the University of Kansas Collection.

Two new species, *Ahaetulla oliveri*, and *Lycodon osmanhilli* are described. Scale data are included for most of the specimens in the collections.

The island of Ceylon is situated southeast of the tip of the Indian peninsula at a distance of about 40 miles from the mainland. The distance between is partially bridged by a small peninsula and several islands, commonly called Adam's Bridge. The peninsula pushes off from the mainland not far from the mouth of the Vaigai river and is, seemingly, a part of the delta of that river. Separated from the peninsula by the narrow Pamban Pass is Rameswaram island, several miles long. From the Ceylon side six islands stretch out towards India separated from each other by narrow straits usually less than two miles wide and from Rameswaram Island by a gap of approximately 20 miles of very shallow water, so shallow in fact that from the air the bottom can be seen for much, if not all the distance.

W. T. Blanford* states that in Eocene and Miocene time the western coast of India lay farther westward than it does at present but that this western extension has disappeared through subsidence leaving several island groups. R. D. Oldham* has postulated that the subsidence was accompanied by the formation of a

* H. B. Medlicott and W. T. Blanford. A Manual of the Geology of India, 1st ed., 1879; 2d ed., 1893 (by R. D. Oldham).

great fault along the west coast. Depths of 2,000 fathoms are now known between the mainland of India and these islands, the Maldivé, Laccadive and Chagos archipelagoes, which were presumably a part of the mainland formerly.

There is evidence † of a more recent (possibly Pleistocene) subsidence. Excavations for a dock in Bombay have revealed a submerged forest, some of the stumps being thirty feet below sea level.

Moreover the reptilian fauna of Ceylon is similar enough to southern India to warrant a postulation that the separation of Ceylon from the continent has taken place in relatively recent times, and that the bulk of the fauna reached Ceylon at a time when the connection was present, and at a much later time than Eocene or Miocene.

That Ceylon has been affected by subsidence in this general area would seem quite likely. A very small elevation of the land now would again bring Ceylon in contact with India; or even a lowering of the sea surface by the piling up of glacial ice on the land might affect sea levels to such an extent as to bring about its union with the mainland. If subsidence has been a slow process corals might keep the isthmus built up to near sea level much as occurs in the formation of atolls. I do not know whether Adams bridge shows such a condition or not.

The serpent fauna of Ceylon bears a close relationship to that of the neighboring part of India. This is true for practically all genera known in Ceylon; but the fauna is far from being identical. Many species have been reported as occurring in both India and Ceylon and are or have been regarded as being identical subspecifically. However, some of the more recent work of Wall (1921), Smith (1943) and Deraniyagala (1948) recognizes subspecific differences in certain forms previously regarded as identical by Boulenger (1890).

The fact remains that the matter of subspecific and specific differences in the faunas of the two areas is still not clearly defined. Colonel Wall, who has written on Ceylon faunae, but whose primary field of interest was the Indian serpent fauna, all too often in his *Ophidia Taprobanica* utilized Indian specimens for his descriptions, and as a basis for data given on the species. In consequence it is often impossible to judge from his work the exact status of a Ceylon form, and the extent to which it differs from that of the Indian mainland. I venture to suggest that one of the most important

† R. B. S. Sewell, Mem. Asia Soc. Bengal, 1935.

contributions one might make to the herpetology of Ceylon would be accumulation of considerable series of specimens from many parts of the Island, as well as from the adjoining southern part of India. Then, and only then, will it be possible to determine the true relationships and the taxonomic status of many of the forms here treated. I anticipate that a study of such material would reveal many other forms differing from Indian species; and furthermore one would expect to find certain Indian species represented by two or more subspecies in Ceylon.

There is some evidence of relationship indicated between faunas of Madagascar and Ceylon. This has been usually explained either by postulating the presence of a continental land mass connecting Ceylon, South India and Madagascar most of which is now lost by subsidence; or by postulating "floating continents." The evidence based on the serpent fauna is indeed small. However the presence of a species of *Sibynophis* in Ceylon and two in Madagascar (one also in the Comoro Islands), and their presumed absence in Africa needs some special explanation. This is made even more evident if one considers the close relationship between the Ceylon lizard genus, *Nessia*, and the Madagascar *Acontias*. Similar relationships between Ceylon and Madagascar are evident in certain other vertebrate groups.

A careful examination of the serpent fauna indicates differences that suggest early arrivals in the country and late arrivals, although the actual or approximate geologic time might be impossible to determine. This is based primarily on degree or extent of evolution. One might regard Typhlopidae and Uropeltidae, each with several endemic species, as belonging in a class with the early arrivals. Each of these must have undergone a long evolution on the island, despite the fact that certain widespread forms of the families occur both in India and Ceylon. Of the very large group comprising the Colubridae I would regard the Sibynophinae, with the genus *Sibynophis*, and *Aspidura* of the Colubrinae, as two of the older genera in Ceylon.

There are five genera presumably endemic in Ceylon: *Pseudotyphlops* belonging to the Uropeltidae with one species; *Cercaspis* with a single species, having highly modified vertebrae; *Haplocercus* with one species; *Balenophis*, an opisthoglyph with specialized nuchal glands; and *Aspidura* with five species (one of which has been reported from the Maldive Archipelago to the west of Ceylon).

The last four mentioned forms are members of the subfamily Colubrinae.

From the evidence at hand the presumably ancient snakes comprising the Anillidae and Boidae have had their evolution elsewhere and only the end products of their evolution persist. These may very probably have reached Ceylon at relatively late periods after the maximum of their specific plasticity had passed. At least the present evidence points to little evolution of these snakes in the islands. However Deraniyagala considers *Python molurus* worthy of subspecific recognition and names the Ceylon form, *P. m. pimbura*, chiefly on the character of the body pattern (a figure is included here showing both dorsal and lateral markings as well as the dorsal squamation of the head) (Pl. XIII, fig. 1).

Among the other families the Viperidae is represented by three forms, two of which are regarded as identical to the Indian forms (*Vipera russelli* and *Echis carinatus*). These possibly are of recent arrival since *E. carinatus* is found only in the extreme northern part and *V. russelli* apparently is in lowland chiefly; this despite the fact that in India it has been reported up to elevations of 7,000 ft. On the other hand the pit vipers (*Trimeresurus* and *Agkistrodon*) seem to have undergone considerable evolution in the islands and may have preceded the two genera mentioned previously by considerable time. One typical *Trimeresurus* is endemic at high elevation in Ceylon, and the genus *Agkistrodon* has itself undergone change and one endemic form is recognized.

Representing the Elapidae are three genera: *Bungarus* with two species (one endemic); *Naja* with presumably one subspecific representative; and *Callophis* with a form probably subspecifically distinct from Indian forms (here not so regarded).

The table which follows compares the fauna of southern India and Ceylon by genera: The endemic genera in southern India are six, while endemic genera in Ceylon number five (in one of these, a species is represented also in the Maldive Archipelago but not in India). There are 74 species in Ceylon, of which 37 are presumably endemic. In southern India 102 species are known.

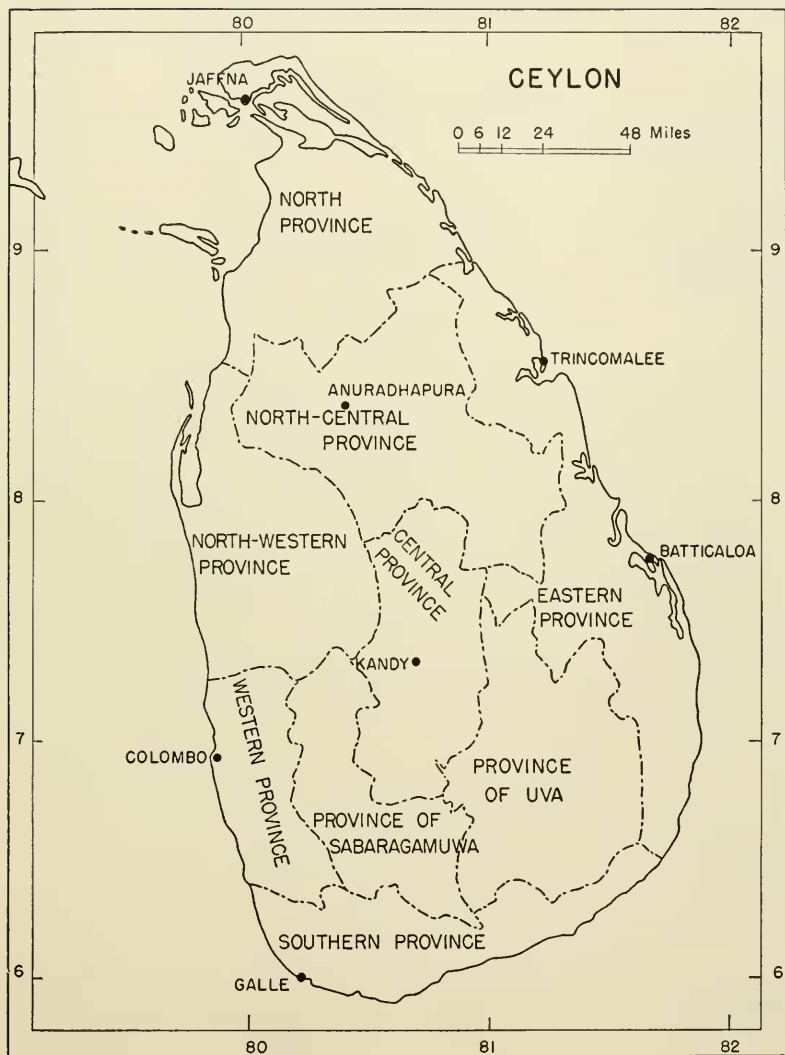


FIG. 1. Map of Ceylon showing provinces.

TABLE OF SNAKE GENERA FOR PENINSULAR INDIA AND CEYLON EXCLUSIVE OF THE SEA SNAKES HYDROPHIIDAE

	Ceylon	Ceylon endemic species	India
Typhlops	10	8	6
Uropeltis	2	2	14
Melanophidium .....	..	..	3
Platyplectrurus .....	..	..	2
Teretrurus .....	..	..	2
Plectrurus .....	..	..	4
Rhinophis	7	7	3
Pseudotyphlops	1	1	..
Cylindrophis	1	1	..
Python	1	..	2
Eryx	1	..	2
Acrochordus	1	..	1
Sibynophis	1	..	1
Elaphe	1	..	1
Ptyas	1	..	1
Coluber	1	..	1
Liopeltis	1	..	2
Oligodon	4	1	9
Ahaetulla	4	1	5
Chrysopelea	2	1	2
Lycodon	3	1	4
Cercaspis	1	1	..
Dryocalamus	2	..	2
Natrix	3	1	4
Balanophis	1	1	..
Macropisthodon	1	..	1
Atretium	1	..	1
Rhabdops .....	..	..	1
Aspidura	5	4	(1 Maldive A.)
Haplocercus	1	1	..
Xylophus .....	..	..	2
Boiga	5	2	3
Dryophis	2	2	4
Enhydrus .....	..	..	1
Hurria	1	..	1
Gerardia	1	..	1
Bungarus	2	1	2
Callophis	1	..	3
Naja	1	..	2
Vipera	1	..	2
Echis	1	..	1
Agkistrodon	2	1	2
Trimeresrus	1	1	4

FAMILY TYPHLOPIDAE

A single genus, *Typhlops*, is represented in Ceylon, no less than ten species being present.

GENUS TYPHLOPS Opperl

Typhlops Opperl, Die Ordnungen, Familien und Gattungen der Reptilien . . ., 1811, p. 54.

Genotype, *Anguis lumbricalis*.

The snakes of the genus *Typhlops* that are known to occur in Ceylon have been treated in a special paper.* However, in order that the listing here may be complete, I have also included these species.

KEY TO THE SPECIES OF TYPHLOPS IN CEYLON

1. Scales in 18 longitudinal rows about body; nasal variable. 2
Scales in 20 or 22 rows about body; nasal divided. 4
2. Nasal incompletely divided, the suture to 2d labial; no subocular; small terminal tail spine; eye distinct; 330-360 transverse scale rows; length 285 mm.; blackish brown above, paler below. *T. porrectus*
Nasal completely divided, the suture to 2d labial; a subocular present; no terminal tail spine; eye usually not visible. 3
3. Upper (posterior) nasals separated behind rostral; 330-360 transverse scale rows on body, brown above, paler below; length 140 mm.; head partly or almost entirely cream. *T. mirus*
Upper (posterior) nasals forming a median suture behind the rostral; 330 transverse scale rows on body; brown above, yellowish white below; length 140 mm. *T. ceylonicus*
4. Scales in 20 longitudinal rows about body. 5
Scales in 22 longitudinal rows about body; eye distinct; nasal suture to 2d labial; (260-280 scale rows, said to agree with *jerdomi*). Black above, whitish below, the colors meeting in a clear line of demarcation; length 130 mm.,
T. leucomelas
5. Nasal suture goes to the preocular. 6
Nasal suture goes to second labial. 9
6. Transverse rows of scales on body more than 280. 8
Transverse scale rows on body less than 275. 7
7. Transverse scale rows, 229-261 on body; subsquamous glands on head forming distinct pattern; eye distinct; underside of head largely cream; part of rostral visible above shorter; length 130 mm. *T. lankaensis*
Transverse scale rows on body, 245; subsquamous glands on head not visible; eye rather indistinct; part of rostral visible above much elongate; snout somewhat truncate at tip; dull violet to lavender; length 111 mm. *T. violaceus*
8. Transverse scale rows on body, 290-330. Pattern of subsquamous glands distinct; eye normally distinct; blackish brown above, paler below; length 170 mm.,
T. braminus
9. Body more attenuated; transverse scale rows on body above 290. 10
Body less attenuated; transverse scale rows 261-273; body brownish above, the pigment becoming less on sides; venter cream save for a pigmented band on throat; eye distinct; width into body length, about 31 times; length 107 mm.,
T. malcolmi
10. Transverse scale rows, 298-326; width of the body into length about 43 to 56 times; light brown above, lighter below. Scales bordering mouth cream; snout rounded anteriorly; upper nasal one-third larger than lower; 3d labial about half area of fourth; length 112 mm. *T. tenebrarum*
Transverse scale rows 295; body width into total length about 60 times; head truncate, subsquamous glands not or scarcely discernible; length 90 mm.,
T. veddae

* Taylor, E. H. Comments on Ceylonese Snakes of the Genus *Typhlops* with descriptions of new species. Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, pp. 283, 298, figs. 1-3.

Typhlops porrectus Stoliczka

Typhlops porrectus Stoliczka, Journ. Asiat. Soc. Bengal, vol. 40, 1871, p. 426, pl. 25, figs. 1-4 (type locality, Bengal, India); Méhely, Termes. Füzetek, vol. 20, 1897, p. 62 (Kala-wewa, Ceylon); Smith, Fauna British India, Ceylon and Burma including the whole Indo-Chinese Subregion; Reptilia and Amphibia, vol. 3, 1943, p. 46 (Punduloya, Ceylon); Taylor, Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, p. 284.

This species is widespread in India but apparently it is uncommon in Ceylon. Two records, that of Méhely in 1897, and that of Smith in 1943 are the only specimens that have been reported.

Typhlops mirus Jan

Typhlops mirus Jan, Iconographie Générale des Ophiens, livr. 1, 1860, p. 9, pls. 5 and 6, fig. 7 (type locality, Ceylon); Günther, Reptiles of British India, 1864, p. 176, pl. 16, fig. H; Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, p. 126; Boulenger, The Fauna of British India including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 240; and Catalogue of the Snakes in the British Museum (Natural History), vol. 1, 1893, p. 52, Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 7-9, fig. 1; Journ. Bombay Nat. Hist. Soc., 29, 1923, p. 348; Smith, The Fauna of British India including Ceylon and Burma; Reptilia and Amphibia, vol. 3, Serpentes, Dec., 1943, p. 55 (Ceylon. Known definitely from Peradeniya); Taylor, Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, pp. 284-285.

Two specimens, EHT-HMS No. 30094, from Peradeniya, Ceylon, and U. S. N. M. No. 56287 "Ceylon" are in the collection. The transverse scale rows of these specimens are 317 and 298, respectively.

Typhlops ceylonicus Smith

Typhlops mirus Wall (part), Ophidia Taprobanica or the Snakes of Ceylon, Colombo, 1923, p. 7. (In one place, in a table, the nasals are reported as meeting behind rostral. At the bottom of the page he states "sometimes in contact behind the rostral.")

Typhlops ceylonicus Smith, Fauna of British India, Ceylon and Burma, including the whole of the Indo-Chinese Subregion; Reptilia and Amphibia, vol. 3, Serpentes, Dec., 1943, pp. 55-56 (type locality, Peradeniya, Ceylon); Taylor, Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, pp. 284-285.

The type of this species is unique.

Typhlops braminus (Daudin)

Eryx braminus Daudin, Histoire naturelle générale et particulière des Reptiles, vol. 7, year 11 (= 1803), pp. 279-280. Based on Russell's *Rondou-Taloulou-pam* in An account of Indian Serpents collected on the Coast of Coromandel, vol. 1, p. 48, pl. 43 (type locality, Vizagapatam, India).

Typhlops braminus Boulenger, Catalogue of the Snakes in the British Museum (Natural History), vol. 1, 1893, p. 16; Wall, Ophidia Taprobanica or the Snakes of Ceylon; Colombo, 1921, pp. 7, 9-13 (figures apparently represent another species); Smith, The Fauna of British India, Ceylon and Burma, including the whole of the Indo-Chinese Subregion; Reptilia and Amphibia, vol. 3, Serpentes, Dec., 1943, pp. 46-48, fig. 14, head; Taylor, Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, pp. 290-291.

Two specimens are in the U. S. N. M. collection, Nos. 120336, 120337 from Clodagh Estate, Rattota, Matale District, and a single specimen is in the EHT-HMS collection from Peradliniya, Central Province. The ventral scales from mental to vent are, respectively, 297, 325, and 317.

Typhlops malcolmi Taylor

Typhlops malcolmi Taylor, Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, pp. 291-292 (type locality, 12 mi. N Trincomalee, Ceylon).

The species is known from the type and a single topotypic paratype specimen, both in the EHT-HMS collection.

A small bicolored snake having 20 longitudinal scale rows; 261-273 transverse scale rows around body; fourth labial twice as large as third, notched behind; a single postocular present; brown above and cream below with a brownish pigmented band crossing throat. Glands on head form a distinct, lighter pattern.

Typhlops violaceus Taylor

Typhlops violaceus Taylor, Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, pp. 289-290 (type locality, 12 mi. N Trincomalee, Ceylon).

This species is known from the type specimen (EHT-HMS collection) only, and may be diagnosed as follows: A small *Typhlops* with eyes dim, but discernible; the nasal completely divided, the nostril lateral but not visible above, the suture dividing nasal touching the preocular far from the labial; 20 longitudinal scale rows; none or only a very small terminal spine; 245 transverse scale rows on body; body width in total length about 31 times. Color, dull violet to lavender, almost the same above and below.

Typhlops veddae Taylor

Typhlops veddae Taylor, Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, pp. 294-296, figs. 3, A-B (type locality, 12 mi. N. Trincomalee, Ceylon).

The unique type specimen is in the EHT-HMS collection. The diagnostic characters are as follows: A very slender *Typhlops* having 20 scale rows, no subocular, the nasal suture to the second labial, the rostral short failing to reach back to eye level by a considerable distance; head somewhat narrowed, and truncate anteriorly; the transverse scale rows about body 295; 14 caudal rows; body width in length about 60 times.

The species, judging by its very slender habitus, and the large number of transverse scale rows is related to *Typhlops braminus*, and to *Typhlops tenebrarum*, described recently. It differs from the former in color, characteristic pattern of glands, and in having the nasal suture touch the labial rather than the preocular. The shape of the head and particularly the shape of the snout, is quite different; the eye is dim, and the diameter of the body is contained in its length 60 instead of "30-45" times, and the tail is proportionally longer.

The type was taken from decaying wood debris, in second growth forest.

Typhlops leucomelas Boulenger

Typhlops leucomelas Boulenger, The Fauna of British India including Ceylon and Burma; Reptilia and Batrachia; London, 1890, pp. 237-238 (type locality, Haycock Mountain, 40 mi. from Galle, Ceylon, 2,000 ft. elevation); and Catalogue of the Snakes in the British Museum (Natural History), vol. 1, 1893, pp. 18-19, pl. 1, fig. 4; Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 13-15, fig. 4; and Spolia Zeylanica, vol. 12, 1922, p. 253; and Journ. Bombay Nat. Hist. Soc., 29, 1923, p. 350; Smith, The Fauna of British India, Ceylon and Burma including the whole of the Indo-Chinese Subregion; Reptilia and Amphibia, vol. 3, Serpentes, Dec., 1943, p. 50; Taylor, Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, pp. 286-287.

No specimens of this species are in the collection.

Typhlops lankaensis Taylor

Typhlops lankaensis Taylor, Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, pp. 287-289, figs. 1, A and B (type locality, 12 mi. N Trincomalee, Ceylon).

This form occurs commonly in the Trincomalee area. The type and 24 paratypes are in the EHT-HMS collection. The diagnostic characters follow:

Head oval, seen from above; suture, dividing nasal completely, reaches to preocular; 20 scale rows about body; rostral somewhat less than one third greatest width of head; transverse scale rows about body, 229-261; generally brown to gray-brown above with very dim longitudinal dorsal lines, the median most distinct; under side of head very largely cream color.

Typhlops tenebrarum Taylor

Typhlops tenebrarum Taylor, Univ. Kansas Sci. Bull., vol. 31, pt. 2, 1947, pp. 292-294, figs. 2, A-C (type locality, 12 mi. N. Trincomalee, Ceylon).

The type and three paratypes are in the EHT-HMS collection. The diagnostic characteristics of the species are as follows: A very slender *Typhlops* with the nasal suture completely dividing the nasal and reaching the second labial; width contained in length from about 43 to 56 times; number of transverse scale rows about body from about 298 to 326 rows; 12 to 14 on tail; 20 longitudinal scale rows about body; light brown above, lighter below and on sides; scales bordering the mouth cream color.

FAMILY UROPELTIDAE

Of this family the genera *Uropeltis*, *Rhinophis*, and *Pseudotyphlops* occur in Ceylon. *Uropeltis* is represented by two endemic species (a third form bears the name *ceylonicus* but apparently it is an Indian snake). *Rhinophis* by eight species and *Pseudotyphlops* by one. Thus eleven of the 45 species known are Ceylonese. One

genus, *Pseudotyphlops*, and eight of the eleven known *Rhinophis* are endemic in Ceylon. However, of the species of *Uropeltis*, 20 of the 22 known species are Indian in distribution.

KEY TO THE CEYLONESE GENERA OF UROPELTIDAE

1. Tail usually obliquely truncate, the truncate portion covered with thickened differentiated scales; terminal caudal scute ending in a transverse ridge, or two points side by side..... *Uropeltis*
Tail not obliquely truncate..... 2
2. Tail ending in a convex or flattened, rounded, rugose shield..... *Rhinophis*
End of tail with a large, subcircular, flat, spinose shield above..... *Pseudotyphlops*

GENUS RHINOPHIS Hemprich

Rhinophis Hemprich, Grundriss der Naturgeschichte, 1820, p. 119.

Genotype, *Tylops oxyrhynchus*; Wagler, Natürliches System der Amphibien, 1830, p. 195.

The genus is represented by eight species in Ceylon. Three others occur in India.

KEY TO THE SPECIES OF RHINOPHIS IN CEYLON

1. Rostral lacking a ridge..... 2
Rostral more or less distinctly ridged..... 3
2. Ventrals 148-168; dark brown, each scale below with a yellow spot or margin; yellow vertical spots on each side on anterior part of body usually connected by a lateral stripe; length 370 mm..... *blythi*
Ventrals 173-191; brown above, uniform or each scale with a white area or margin, more extensive below; light spots may be present, or bars on sides; a ring around base of tail; length 500 mm..... *drummondhayi*
3. Rostral equal or less than half the length of the headshields; rostral obtusely ridged..... 4
Rostral more than half the length of the headshields; strongly ridged..... 5
4. Ventrals 180-204; blackish brown, the scales with lighter margins; a series of cream spots along sides..... *homolepis*
Ventrals 153-182; brown above and below with the scales somewhat lighter margined; no lateral cream spots..... *philippinus*
5. Uniform brown above and below; ventrals 211-227; rostral reddish.... *oxyrhynchus*
Not uniform brown above and below..... 6
6. A black vertebral line between two light lines..... 7
No black vertebral line between two light lines..... 8
7. Ventrals 236-246; diameter in length 46 times..... *punctatus*
Ventrals 281; diameter in length 76 times..... *porrectus*
8. A broad orange stripe dorsally, bearing black blotches; ventrals 238.... *dorsinaculatus*

Rhinophis blythi (Kelaart)

Rhinophis blythi Kelaart, Prodrum Fauna Zeylanica, vol. 2, 1854, p. 14 (type locality, Mountains of Ceylon); Smith, Fauna of British India . . . , Reptilia and Amphibia, vol. 3, 1943, pp. 88-89.

No specimens in the collection.

Rhinophis drummondhayi Wall

Rhinophis drummondhayi Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 43-44 (type locality, Uva Patnas, Ceylon).

No specimens in the collection.

Rhinophis porrectus Wall

Rhinophis porrectus Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 35-36 (type locality, "on road between Puttalam and Chilaw").

No specimens in the collection.

Smith has placed this form in the synonymy of *Rhinophis punctatus*. I cannot agree since the characters are too striking to warrant such an association. The ventral count is 281, 35 above the highest known count for *punctatus*, and the body is slenderer, the diameter in total length about 76 times while Smith's specimen of *R. punctatus* has the diameter in total length, 47.5 times.

The length is 355 mm. The head is black brown, while the tip of snout is dull orange. A narrow blackish brown vertebral line passes from the nape to near the end of the body occupying the medial part of the vertebral scale row. This is bordered by whitish stripes. The caudal shield is dull orange with a subterminal dark mark. The species is known from Northwest Province.

Rhinophis punctatus Müller

Rhinophis punctatus Müller, Tiedemann and Treviranus Zeitschrift für Physiologie, vol. 3, p. 1832, pp. 248-249, pl. XXI, figs. 1-3 (cranium), pl. 22, figs 1, a-c (head), d-f (tail) (type locality, Ceylon); Peters, De Serpente familia Uropeltaceorum, 1861, pp. 12-13, pl. 2, fig. 3; Smith, Fauna of British India . . . , Reptilia and Amphibia, vol. 3, 1943, p. 92 (in part).

No specimen is in the collection. The characters given in the key will suffice to separate the form from others known in Ceylon. The species is reported from Central Province: Kandy and Peradeniya.

Rhinophis philippinus (Cuvier)

Typhlops philippinus Cuvier, Règne Animal, 2d ed., vol. 2 1829, p. 74.

Rhinophis philippinus Müller, Tiedemann's und Treviranus' Zeitschrift für Physiologie, vol. 4, 1832, p. 249; Duméril, Bibron and Duméril, Erpétologie Générale, vol. 7, 1854, p. 154, Atlas, pl. 59, fig. 1; Peters, De Serpente familia Uropeltaceorum, Berlin, 1861, pp. 15-16; Günther, Reptiles of British India, 1864, p. 184; Smith, Fauna of British India . . . , Reptilia and Batrachia vol. 3, 1943, p. 91.

Rhinophis planiceps Peters, De Serpente familia Uropeltaceorum, Berlin, 1861, p. 17, pl. 1, fig. 9.

A specimen in the EHT-HMS collection (No. 30387) from Peradeniya and U. S. Nat. Mus. No. 56402, "Ceylon," are referred to this species. The first is uniform brownish, the scales showing somewhat lighter edges, the ventral scale rows having the light edges a little wider than the dorsals. The under side of the snout, the lower labials and most of the two anal plates are cream. The top of the head is convex, not flattened, and the rostral length above is somewhat more than one third of the shielded part of head, but much less than one half. There are four supralabials and three infra-labials. An azygous preanal, triangular in shape is present. The

anal is large and divided, followed by a divided postanal only a little smaller than anal. This is followed by five subcaudals all of which are undivided except the fifth. The shield on the tail is as long as the shielded part of the head. The ventrals are 155 in this male specimen; subcaudals as described, five.

No. 56402 is blackish brown with light edges on the scales. The under side of the labials and rostral, and a part of the divided anal scale are cream. The ventrals are 174 ♀; subcaudals: one divided postanal followed by a divided subcaudal and one single scale totalling three.

Two specimens, U.K.M.N.H. Nos. 21433 "Ceylon," and 21434 Polgahaivela, Ceylon, have the following characters respectively: total length, 183 mm., 176 mm.; tail, 5, 7; ventrals, 177, 179; subcaudals, 3, 6; scale formulae, 19, 17, 17, 17; 19, 17, 17, 17; diameter of body, 8.8 mm., 6.8 mm.

The rostral length is slightly less than its distance from the rostral to back of frontal in both. In the longer the rostral separates the prefrontals for less than one half the suture, in the shorter the separation is more than half the length of the suture.

Rhinophis oxyrhynchus (Schneider)

Pl. XII, fig. 2

Typhlops oxyrhynchus Schneider, *Historia Amphibiorum*, vol. 2, p. 341 (type locality, Ceylon).

Rhinophis oxyrhynchus Hemprich, *Grundriss der Naturgeschichte*, 1820, p. 119; Duméril, Bibron and Duméril, *Erpétologie Générale*, vol. 7, 1854, pp. 156-157 (*oxyrhynchus*).

Dapatnaya lankadivana Keziaat, *Prodromus Faunae Zeylanicae*, vol. 2, 1854, pp. 16-17 (type locality, "Common at Trincomalee and in the Kandyan Province").

Mytilia unimaculata Gray, *Proc. Zool. Soc. London*, 1858, p. 264, fig. (type locality, Ceylon).

I collected a specimen, EHT-HMS No. 31256, about 6 miles north of Trincomalee that is typical in its general characters. The ventrals are 216; the subcaudals 8; the scale rows on neck, 19; on the body 17. A pair of elongate postanal scales are followed by seven subcaudals. The median dorsals are much widened on tail. The rostral is distinctly longer than its distance to the back of the parietals. The length is 329 mm., the tail, 8 mm. The diameter of the body is 8 mm.

The species is known from Northern and Eastern provinces (in the north). I collected a specimen crawling in the road at midday 14 miles north of Trincomalee. It escaped from a faulty collecting bag into a raft while crossing a lagoon and could not be recovered.

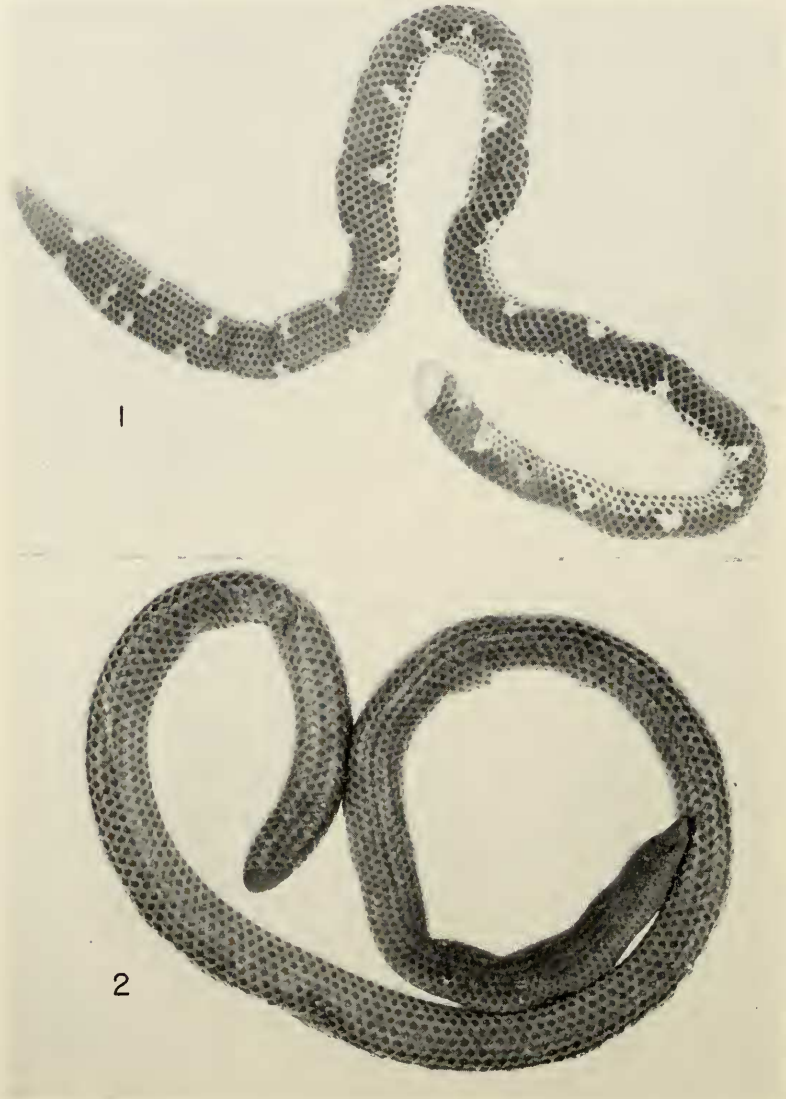


PLATE XII. Fig. 1. *Rhinophis homolepis* Hemprich. U. S. N. M. No. 56430; "Ceylon"; total length, 243 mm. Fig. 2. *Rhinophis oxyrhynchus* (Schneider). EHT-HMS No. 31256; 6 mi. north Trincomalee, Eastern Province, Ceylon.

Rhinophis homolepis Hemprich

Pl. XII, fig. 1

Rhinophis homolepis Hemprich, Grundriss der Naturgeschichte, 1820, p. 119 (type locality, Ceylon *vide* Peters); Peters, De Serpentina Familia Uropeltaceorum, 1861, pp. 14-15, pl. 2, fig. 2; Smith, Fauna of British India . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 90-91.

Dapatnaya trevelyana Kelaart, Prodromus fauna Zeylanicae, vol. 2, pt. 1, 1854, p. 17 (type locality, Kandyan Hills).

Mitylia or *Mytilia Gerrardi* Gray, Proc. London Zool. Soc., vol. 26, 1858, pp. 58, 263, pl. 13 (type locality, Ceylon).

A specimen in the collection (U. S. Nat. Mus. No. 56430) from "Ceylon" has the following scale characters: Ventrals 197, somewhat enlarged; 3 subcaudals; anal divided; scale formula, 19-17.

The head is diminutive, the shielded part being shorter than the terminal caudal plate. There are 23 lateral white spots, the largest of which are on the neck. The postanal shield is white. The species is known from Central Province, Uva Province, and Sabaragamuwa Province.

Rhinophis dorsimaculatus Deraniyagala

Rhinophis dorsimaculatus Deraniyagala, Journ. Bombay Nat. Hist. Soc., Dec., 1941, pp. 800-802, pl. and text fig. 1 (type locality, Marichchukate, Northwest Province, Ceylon); Smith, Fauna of British India . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, p. 526.

This recently described species is known from the two type specimens, which were found in the arid part of Ceylon in the north. It is characterized by a broad dorsal orange stripe with small dorsal spots. The total length of the largest specimen is 350 mm. The ventrals are 238 and the scales are in 17 rows.

GENUS UROPELTIS Cuvier

Uropeltis Cuvier, Règne Animal, 2d ed., 1829, vol. 2, p. 76 (part).
Genotype, *ceylanicus*.

Two forms of the genus occur in Ceylon.

KEY TO THE SPECIES OF UROPELTIS IN CEYLON

- Ventrals 141-166; belly black; dark brown above with an irregular lateral stripe, *melanogaster*
Ventrals 197-210; bluish gray, with 7 median dorsal rows bearing yellow longitudinal lines made of yellow dots; a lateral series of yellow bars. *phillipsi*

Uropeltis melanogaster (Gray)

Mytilia (Crcalia) melanogaster Gray, Proc. Zool. Soc. London, 1858, p. 264, fig. 5 (type locality, Ceylon).

Uropeltis melanogaster Smith, Fauna British India . . . , Reptilia and Amphibia, vol. 3, 1943, pp. 86-87.

Four specimens of this species are at hand: U. S. Nat. Mus. Nos. 7134, 56397, 56398, 56400. All are from "Ceylon." The species is known from Central Province.

SCALE COUNTS OF *Uropeltis melanogaster*

Number	Sex	Scale rows	Ventrals	Subcaudals	Total length mm.	Tail mm.
7134	♀	19-17	167	6	220	7
56397	♂	19-17	160	10—4 wide	144	6.8
56398	♀	19-17	168	7	200	6.6
56400	♂	19-17	160	9—6 wide	145	7

[Ventrals counted from mental.]

The specimens are somewhat variable in color. No. 56398 is blackish brown, the venter even darker but bordered by an extremely ragged cream line, sometimes discontinuous, varying in width and distinctness. No. 7134 is brown, the light stripes less ragged.

The two males are light brown and the ventral surfaces are largely yellowish cream with occasional brownish scales. The ventrals range from 141 to 168 (counting from the mental).

Uropeltis phillipsi (Nicholls)

Silybura phillipsi Nicholls, Ceylon Journ. Sci., B, vol. 12, 1929, p. 153; and *idem*, D. II, 1929, p. 97 (type locality, Menakanda Group, E Matale Hills, Ceylon).

Uropeltis phillipsi Smith, Fauna British India . . ., Reptilia and Amphibia, vol. 3, 1943, p. 81.

This form is known only from the type locality and Mouskandy Hills, Gammadura, according to Smith.

GENUS PSEUDOTYPHLOPS Schlegel

Pseudo-typhlops (in part) Schlegel, Abbildungen neuer oder unvollständig bekannter Amphibien, 1838, p. 40 (type *philippinus* [fide M. Smith, *loc. cit.*]).

A single species known. It is endemic in Ceylon.

Pseudotyphlops philippinus (Cuvier)

Uropeltis philippinus Cuvier, Règne Animal, 2d ed., vol. 2, 1829, p. 74 (type locality, "Philippines" *ex errore*); Müller, Tiedemann and Treviranus, Zeitsch. für Physiol., vol. 4, pl. 22, figs. 2-3 Gervais Guérin Mag. Zool., 1837, Cl. 3, pl. 13; Duméril, Bibron and Duméril, Erpétologie Générale, vol. 7, 1854, pp. 161-163, Atlas, pl. 59, fig. 2 (see considerable synonymy); Peters, De Serpentum Familia Uropeltaceorum, Berolini, 1861, p. 20.

Pseudotyphlops philippinus Schlegel, Abbildungen neuer oder unvollständig bekannter Amphibien, 1838, p. 44; Smith, Fauna British India . . ., Reptilia and Amphibia, vol. 3, 1943, pp. 93-94, fig. 27.

Uropeltis grandis Kelaart, Prodrömus Faunae Zeylanicae, vol. 2, 1854, p. 15 (type locality, Kerinday, near Matura, South Province, Ceylon).

Uropeltis saffragamus Kelaart, Prodrömus Faunae Zeylanicae, vol. 2, 1854, p. 15 (type locality, Ratnapoora near Adams Peak, Ceylon).

Uropeltis pardialis Kelaart, Prodrömus Faunae Zeylanicae, vol. 2, 1854, p. 16 (type locality, Matura, Ceylon).

The collection contains no specimens belonging to this species. It is a large species of the family, reaching a length of 285 mm. and a diameter of 22 mm., the latter measurement being much larger than that of any other member of the family. The species is dark brown to blackish above, the young having yellow spots. Yellow beneath, the young with dark brown spots on venter.

A lowland form for the most part.

FAMILY ANILIIDAE

GENUS CYLINDROPHIS Wagler

Cylindrophis Wagler, Icon. Amphib., 1828, p. 5.
Genotype, *resplendens*.

One species occurs in Ceylon.

Cylindrophis maculatus (Linnaeus)

Anguis maculata Linnaeus, Museum Regis Adolphi Friderici, p. 21, pl. 21, fig. 3 (type locality, "America"); and Systema Naturae, vol. 1, 10th ed., 1758, p. 228.

Cylindrophis maculatus Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 18-21, figs. 5-6.

The species is said to be common in Ceylon in the plains and in the hills at low elevations. There are no specimens in the collection.

FAMILY BOIDAE

SUBFAMILY PYTHONINAE

Two genera, each represented by a single species, occur in Ceylon.

KEY TO THE GENERA OF THE BOIDAE IN CEYLON

Teeth on the premaxilla; anterior labials and rostral pitted..... *Python*
No premaxillary teeth; rostral and labials not pitted..... *Eryx*

GENUS PYTHON Daudin

Python Daudin, Mag. Encycl., Mar. 1803 (an 8), p. 434.
Genotype, *Python molurus*.

Python molurus Pimbura (Deraniyagala)

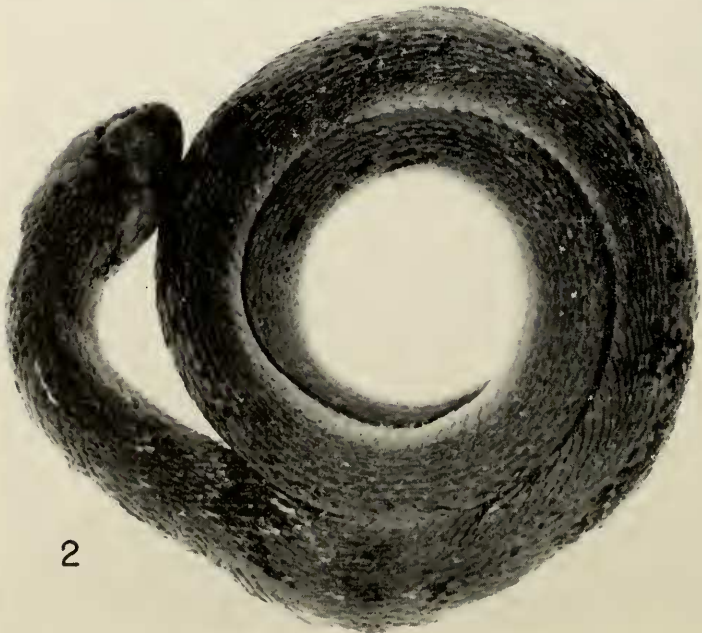
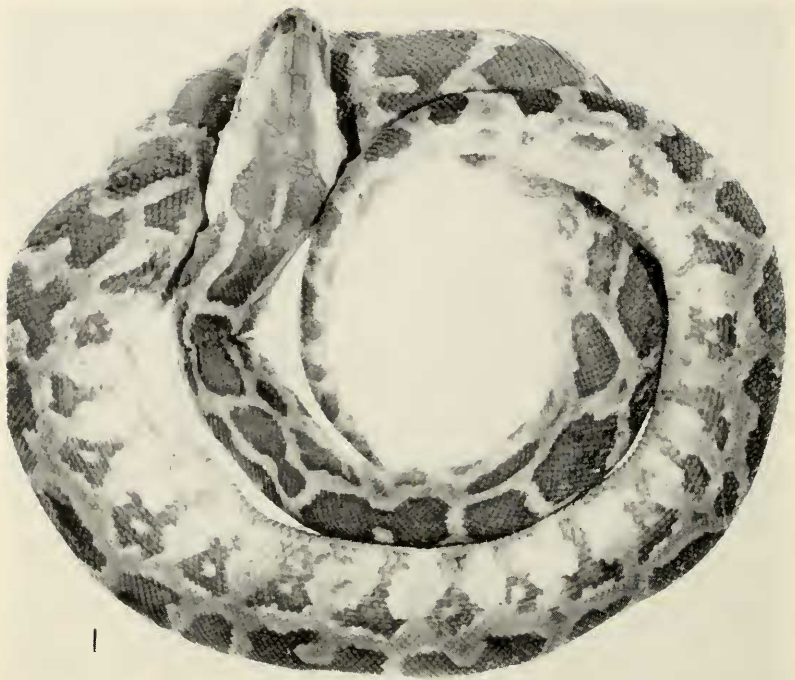
Pl. XIII, fig. 1

Python molurus pimbura Deraniyagala, Spolia Zeylanica, vol. 24, pt. 2, 1945, p. 165 (Colombo, Ceylon).

EHT-HMS Nos. 31258 yg.; 31259 yg.; 31260 (head only).

The presence of *Python molurus* has long been known in Ceylon. It is one of the more common snakes of the country. Two specimens were found fifteen miles north of Trincomalee on a tiny islet about one and one half miles offshore. One was dead beside a small rock pool of fresh water having been recently killed, presumably by fishermen. The second specimen was found submerged in another fresh water pool containing much algae. The tip of the snout extended above the surface amid the algae, near the edge. Since the dead specimen had recently fed on a wood pigeon, it was suspected that the snakes caught their prey as the birds drank in the fresh water pools. This was the only species of land snake obtained on the island. Numerous land birds were accustomed to fly over to the island daily and the snake population was assured of a regular food supply about the fresh water pools in the rocks.

Scale counts of Nos. 31258 and 31259 respectively: Ventrals 248, 233; anal 1-1; caudals 61, 63; scale formula 55-64-41, 55-59-38.



2

PLATE XIII. Fig. 1. *Python molurus pimbura* Deraniyagala. EHT-HMS No. 31258, yg.; 12 miles north Trincomalee, Eastern Province, Ceylon; total length, 612 mm. Fig. 2. *Macropisthodon plumbicolor* (Cantor). EHT-HMS No. 30681 ♀; 50 mi. S Anuradapura, Ceylon; total length, 627 mm. (The characteristic head and neck markings were visible before the loss of the outer epidermis).

GENUS *ERYX* Daudin

Eryx Daudin, Mag. Encycl., vol. 5, 1803, p. 437.
Genotype, *turcicus*.

Eryx conicus (Schneider)

Boa conica Schneider, Historia Amphibiorum naturalis et literaria Jena 1799-1801, vol. 2, p. 268; Denkschr. Akad. München, vol. 7, 1821, p. 119, pl. 4, fig. 2 (based on Russell's Indian Serpents, vol. 1, p. 4, pl. † [Madras]).

Eryx conicus Deraniyagala, Ceylon Journ. Sci., B, vol. 19, 1936, p. 335, fig.; Smith, The Fauna of British Indian, Ceylon and Burma including the whole of the Indo-Chinese sub-region; Reptilia and Amphibia, vol. 3, Serpentes, 1943, p. 112-113, fig. 35.

No specimens of the sand boa are in the collections. It is regarded as a rare snake in Ceylon.

FAMILY COLUBRIDAE

Four subfamilies of the family Colubridae are represented in Ceylon. These are:

Acrochordinae, genus *Acrochordus*.

Homalopsinae, genus *Hurria*.

Sibynophiinae, genus *Sibynophis*.

Colubrinae, genera *Elaphe*, *Ptyas*, *Coluber*, *Liopeltis*, *Oligodon*, *Ahaetulla*, *Crysopelea*, *Lycodon*, *Cercaspis*, *Dryocalamus*, *Aspidura*, *Haplocercus*, *Dryophis*, *Boiga*, *Natrix*, *Balanophis*, *Macropisthodon*, and *Atretium*.

KEY TO THE SUBFAMILIES OF CEYLONESE COLUBRIDAE

1. Dentary free behind, attached to articulare anteriorly; maxillary teeth 30 to 50.
Head with large symmetrical shields: no grooved teeth..... *Sibynophiinae*
Dentary not free behind; maxillary teeth usually less than 35..... 2
2. Head covered with small granular scales; no widened ventral scales; body covered with loose skin; eyes more dorsal than lateral; posterior maxillary teeth not grooved *Acrochordinae*
Head covered with enlarged regular shields; teeth grooved or not..... 3
3. Nostril crescentic, on dorsal surface of the snout; rostral without the normal deep excavations for tongue protrusion; eye small, directed upward; last two or three maxillary teeth grooved; salt or fresh water snakes..... *Homalopsinae*
Nostril not crescentic, not on dorsal surface of snout; rostral with excavations for tongue extrusion; eyes lateral, directed outward; maxillary teeth with or without grooves *Colubrinae*

SUBFAMILY ACROCHORDINAE

Acrochordinae Boulenger, Catalogue of the Snakes in the British Museum, vol. 1, 1893, p. 172 (part); Smith, The Fauna of British India . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, p. 131.

M. Smith, *loc. cit.*, has united the two genera *Acrochordus* and *Chersydrus* into the single genus *Acrochordus*, stating that he did not regard the presence of the ventral abdominal fold a character of sufficient importance to warrant the retention of *Chersydrus*.

GENUS ACROCHORDUS Hornstedt

Acrochordus Hornstedt, Abh. Acad. Stockholm, 1787, vol. 8, p. 307.
Genotype, *Acrochordus javanicus*.

Acrochordus granulatus (Schneider)

Hydrus granulatus Schneider, Historia Amphibiorum naturalis et literaria, vol. 1, 1799, p. 243 (type locality, India).

Acrochordus granulatus Shaw, General Zoology, vol. 3, 1802, p. 576, pl. 130; Smith, The Fauna of British India . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 134-135

No specimens in the collection.

SUBFAMILY SIBYNOPHINAE

Two genera are known.

GENUS SIBYNOPHIS Fitzinger

Sibynophis Fitzinger, Systema Reptilium, 1843, p. 26.
Genotype, *Herpetodryas geminatus* Schlegel.

Taylor and Smith* have separated the Mexican and Central American species of this subfamily into a separate genus, *Scaphiodontophis*.

The range of the genus *Sibynophis* includes Madagascar, Comoro Islands, Ceylon and south Asia from India to China. There are ten valid species known.

Sibynophis subpunctatus (Duméril, Bibron and Duméril)

Pl. XIX, fig. 1

Oligodon subpunctatum Duméril, Bibron and Duméril, *Erbéologie Générale*, vol. 7, 1854, p. 58 (type locality, "Malabar").

Polyodontophus subpunctatum Boulenger, *Fauna British India including Ceylon and Burma, Reptilia and Batrachia*, 1890, p. 303 (Ceylon); *Catalogue of the Snakes in the British Museum*, vol. 1, 1893, pp. 186-187; Abercromby, *Spolia Zeylanica*, vol. 8, pt. 32, Jan., 1913, pp. 304-305 (Colombo, Matale, Kalutara); Wall, *Ophidia Taprobanica or the Snakes of Ceylon*, 1921, pp. 84-89, fig. 20 (Colombo; Neboda near Kalutara; Puttalam; Galatura Estate Colombo; Ratnapura District, 1,000 ft.).

Enicognathus humberti Jan, *Arch. Zool. Anat. Fis.*, vol. 2, fasc. 2, Mar. 31, 1863, p. 65; *Elenco sistematico degli Ofidi*, 1863, p. 50 ("Trincomalie, Ceylan"); *L'étonographie Générale des Ophidiens*, livr. 16, 1866, pl. 4, fig. 1 ("Trincomalie, Ceylan").

EHT-HMS Nos. 31251-31253, 12 miles north of Trincomalee; U. S. Nat. Mus. No. 56231.

This small species has long been known from Ceylon. It is probably not a rare snake but its diminutive size prevents it appearing commonly in collections. Two specimens were taken moving about at night, and one was found concealed below a small log in the day time.

* Univ. Kansas Sci. Bull., vol. 29, pt. 2, no. 6, pp. 302-304.

The squamation characters follow: EHT-HMS 31252. Rostral visible above for a distance equal to half the length of the internasals; latter, two thirds the length of prefrontals; frontal a third longer than its distance from snout tip, the sides not angular; parietals large, their length equal to their distance from rostral; nasal divided; loreal longer than high; one preocular, two large postoculars; two anterior temporals, the lower widely separated from the postoculars, wedged between the seventh and eighth labial; tem-

poral formula $2 + \frac{1}{2}$; supralabials 9-9, in the following order of size: 1, 5, 4, 3, 2, 6, 7, 8, 9; infralabials 10-10, four touching the first chinshields; 2 pairs of chinshields, subequal.

Scale formula, 17-17-17; ventrals 170, anal divided; subcaudals (divided) 32 (tail with a part missing).

The ventral and subcaudal counts for EHT-HMS Nos. 31234 ♂ and 31235 ♂ respectively are: 157, 163; 58, 66.

The ventral and subcaudal variation is large in this species. Smith, *loc. cit.*, gives for the Ceylon and South Indian (south of latitude 14°) specimens, 157-200 ventrals; India north of latitude 18°, 172-215 ventrals. The all-over count of males, 60-70 subcaudals, for females, 54-63.

Head dark brownish, a cream white spot covering most of each supralabial; a lighter band between the posterior part of eyes, which connects with two lighter irregular marks running above eyes and on canthus to rostral; a well-defined cream bar on each side of head crossing ninth supralabial and passing up covering extreme tips of parietals. These bars separated medianly by a narrow black longitudinal line; behind these bars, four to six scale rows, a transverse cream band, only partially interrupted mesially. The dorsal color is brownish produced by a peppering of pigment on a lighter background; a median row of darker punctations often outlined in cream; on the posterior part of the body a line formed of short cream dashes is discernible on the fourth and (more posteriorly) fifth scale rows. A dark spot on ends of the ventrals and subcaudals distinct throughout entire length on males, somewhat less distinct in the female.

The species is confined largely to the lowland and hill areas in Ceylon and is seemingly a rare snake.

KEY TO THE CEYLONESE GENERA OF THE COLUBRINÆ

- | | | |
|-----|--|-----------------------|
| 1. | All maxillary teeth solid, lacking grooves..... | 5 |
| | Posterior maxillary teeth (usually two to four) with grooves..... | 2 |
| 2. | Pupil round..... | 3 |
| | Pupil vertical or horizontal..... | 4 |
| 3. | Solid maxillary teeth 24-26, subequal; posterior fangs large; head distinct from neck; scales strongly keeled save outer row; ventrals rounded; a mehal gland; scale rows 19 around middle of body..... | <i>Balanophis</i> |
| | Maxillary teeth 20-22, the last three or four feebly enlarged and grooved; scales smooth or feebly keeled; scales in 17 rows..... | <i>Chrysopelca</i> |
| 4. | Pupil vertical; body more or less compressed; scales smooth, in 19-29 rows, the vertebral scales often enlarged; 10 to 14 maxillary teeth, followed by two or three enlarged grooved fangs..... | <i>Boiga</i> |
| | Pupil horizontal; maxillary teeth 12, the anterior six or seven teeth gradually enlarged (or last two abruptly enlarged); these followed after an interspace, by a series of seven small teeth, and these in turn followed by two much enlarged grooved fangs..... | <i>Dryophis</i> |
| 5. | Hypapophyses absent on the posterior dorsal vertebrae, the lower surface of which is smooth or with a very low keel..... | 6 |
| | Hypapophyses developed throughout the vertebral column represented by a distinct crest or keel or a tubercle..... | 15 |
| 6. | Posterior maxillary teeth longer than anterior..... | 7 |
| | Posterior maxillary teeth not longer than anterior..... | 11 |
| 7. | Pupil round..... | 8 |
| | Pupil vertical; six to ten maxillary teeth; scales in 13 or 15 rows, smooth; the ventrals angulate..... | <i>Dryocalamus</i> |
| 8. | Scales in an even number of rows throughout body, 14-18, smooth or slightly keeled; teeth 20-23; a presubocular present..... | <i>Zaocys</i> |
| | Scales in odd number of rows or, at least, odd numbers on anterior part of body.. | 9 |
| 9. | Last two maxillary teeth separated by an interval from rest of series; maxillary teeth 12-18, increasing in size; a subocular (rarely absent); 21 to 23 scale rows about middle of body; large snakes of more than a meter length... | <i>Coluber</i> |
| | Last two maxillary teeth not separated by an interval..... | 10 |
| 10. | Maxillary teeth 20-28, forming a continuous series; scales often in even numbers on latter half of body; two or three (rarely four) loreals; large snakes 2 meters or more in length..... | <i>Ptyas</i> |
| | Maxillary teeth 6 to 16, the posterior strongly enlarged and compressed; scales in 13-21 rows; rostral large; scales smooth; small snakes, less than a meter in length..... | <i>Oligodon</i> |
| 11. | Pupil round; none of the anterior maxillary teeth enlarged, the series not broken by an interval; maxillary bone not strongly arched..... | 12 |
| | Pupil vertically elliptic; some of the anterior maxillary teeth enlarged and fang-like; maxillary strongly arched..... | 14 |
| 12. | Scales in 19-27 rows, with apical pits..... | <i>Elophie</i> |
| | Scales less than 19 rows; apical pits present or absent..... | 13 |
| 13. | Scales 13-17 rows, the vertebrae not enlarged, without apical pits..... | <i>Liopeltis</i> |
| | Scales 13-15, rows disposed in oblique transverse rows, with enlarged vertebrae, apical pits present..... | <i>Ahaetulla</i> |
| 14. | Scales in 15 or 17 rows, smooth or feebly keeled; subcaudals divided..... | <i>Lygodon</i> |
| | Scales in 19 rows, strongly keeled, subcaudals single..... | <i>Cercaspis</i> |
| 15. | Posterior maxillary teeth longest; head distinct from neck; loreal present; one or two internasals..... | 16 |
| | Maxillary teeth subequal; head not distinct from neck; scales in 15-17 rows; no loreal; internasal single..... | 18 |
| 16. | Two internasals; nostrils lateral; scales in 20-25 rows, strongly keeled..... | 17 |
| | One internasal; nostrils directed upward and outward, scales in 19 rows at mid-body..... | <i>Atractium</i> |
| 17. | Maxillary teeth 20 to 35; posterior teeth not fanglike; scales in 15-19 rows... | <i>Natrix</i> |
| | Maxillary teeth 11 to 18, followed by two very large fangs; scales in 25 to 27 rows..... | <i>Macropisthodon</i> |
| 18. | Maxillary teeth, 20-24; scales 15-17 rows; heavy spines on sides in anal region in ♂..... | <i>Aspidura</i> |
| | Maxillary teeth 10-12; scales in 17 rows; no lateral spines in anal region.. | <i>Haplocercus</i> |

GENUS ELAPHE Fitzinger

Elaphe Fitzinger, in Wagler's Icon. Desc. Amphib., pt. 3, 1828, text to plate 27 (*vide* M. Smith).

Genotype, *parrysi* = *quatuorlineatus*.

A single species of the genus occurs in Ceylon.

Elaphe helena (Daudin)

PL. XIV

Coluber helena Daudin, Histoire Naturelle des Reptiles, vol. 6, year 11 = 1803 (based on Russell's plate, Hist. Nat. of Indian Coromandel Serpents, pl. 32); Pearless, Spolia Zeylanica, vol. 6, pt. 21, 1909, pp. 55 (Badulla, 2,222 ft. elev.); Wall, Ophidia Taprobanica . . ., 1921, pp. 197-203, fig. 42 ("a common up country snake," Colombo).

Cynophis bistrigatus Gray, Ann. Mag. Nat. Hist., ser. 2, vol. 4, p. 246 (type locality, Ceylon).

Elaphe helena Shaw, Shebbeare and Barker, Journ. Darjeeling Nat. Hist. Soc., vol. 14, 1939, p. 78; Smith, The Fauna of British India . . ., Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 149-152.

Wall, *loc. cit.*, suspects that the Colombo record might be accounted for by an importation from the hills. However, I collected a specimen 12 miles north of Trincomalee at near sea level and another was seen. It was said to be "not rare" in the area.

The specimen EHT-HMS 30680 ♀ has the following scale characters: Color of head lavender to fawn-brown with a black line following the parietal suture and a diagonal line behind eye; a black spot on upper edge of last supralabial. On body, lavender-brown with a pair of black lines beginning just back of the parietals and passing back on the neck for about an inch. Here they become indistinct but can be dimly traced some distance further. A diagonal line on the side of the neck beginning five or six scale lengths back of the jaw angle and terminating on the end of the tenth ventral; a series of indefinite dark blotches follow the lines, the "spots" consisting largely of dark outlines on the scales contiguous laterally with a light spot on the fifth and sixth scale rows and one on the first, second and third scale rows, the two light spots at least partially outlined with black; about one third of the length back of head the blotches become almost or completely obsolete; but a broad dark line, scarcely noticeable on the anterior half of the body becomes more distinct on the latter half of body and tail, covering most of the second to fifth rows of scales, reduced to a single scale row on tail. Below uniform yellow cream.

The scale formula is 29-27-21; ventrals 235; anal single; subcaudals 86. The known ventral range is from 217-265; subcaudals 73-100, according to Smith, *loc. cit.*

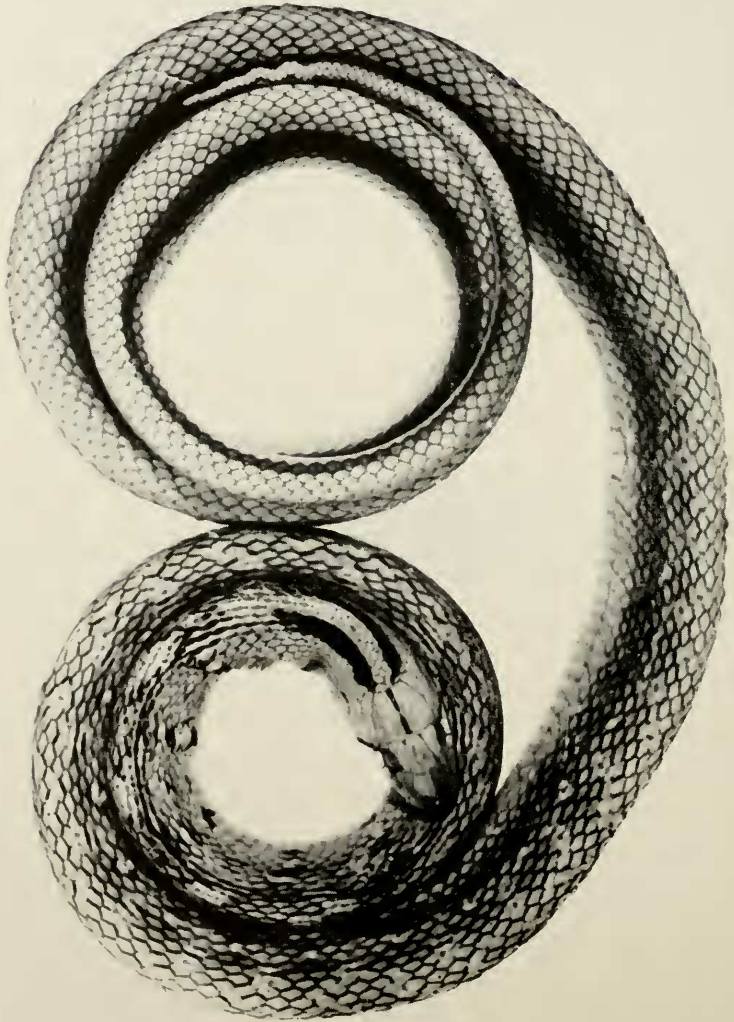


PLATE XIV. *Elaphe helena* (Daudin) ♀. EHT-HMS No. 30680; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 1,135 mm.

TABLE OF DATA ON CEYLONESE SPECIMENS OF *Ptyas mucosus*

Number	Sex	Ventrals	Sub-caudals	LoREAL	Scale formula	Pre-oculars	Post-oculars	Supra-labials	Infra-labials	Temporals	Labials enter eye
30696	♂	201	141	3-3	21, 17, 14, 14	2-2	2-2	8-8	9-11	2+2	4th and 5th
30697	♂	197	139	3-3	21, 17, 14, 14	2-2	2-2	8-8	10-10	$\frac{2}{1}+2$	4th and 5th
30698	♂	204	139	2-2	21, 17, 17, 14	2-2	2-2	8-8	10-10	2+2	4th and 5th
30699	♂	200	133	3-3	19, 17, 16, 14	2-2	2-2	8-8	11-11	2+2	4th and 5th
30700	♀	207	146	4-4	21, 17, 14, 14	2-2	2-3	8-8	10-10	2+2	4th and 5th
30701	♀	206	141	3-2	21, 17, 16, 14	2-2	2-2	8-8	10-10	2+2	4th and 5th

GENUS *PTYAS* Fitzinger

Ptyas Fitzinger, *Systema Reptilia*, 1843, p. 26.

Genotype, *Coluber blumenbachi*.

One species occurs in Ceylon. It is a large snake reaching approximately two meters in length when full grown.

Ptyas mucosus (Linnaeus)

Pl. XV, fig. 1

Coluber mucosus Linnaeus, *Museum Adolphi Friderici regis*, vol. 1, p. 37, pl. 23; *Systema Naturae*, ed. 10, 1758, p. 226 (type locality, India).

Ptyas mucosus Günther, *Reptiles of British India*, 1864, p. 249.

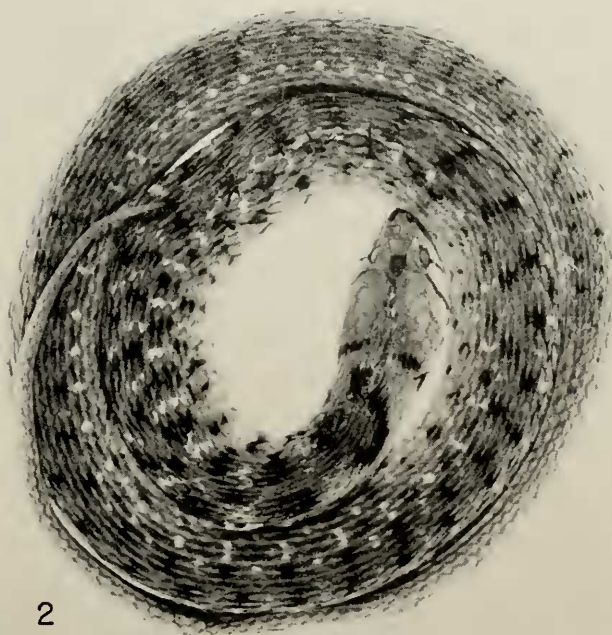
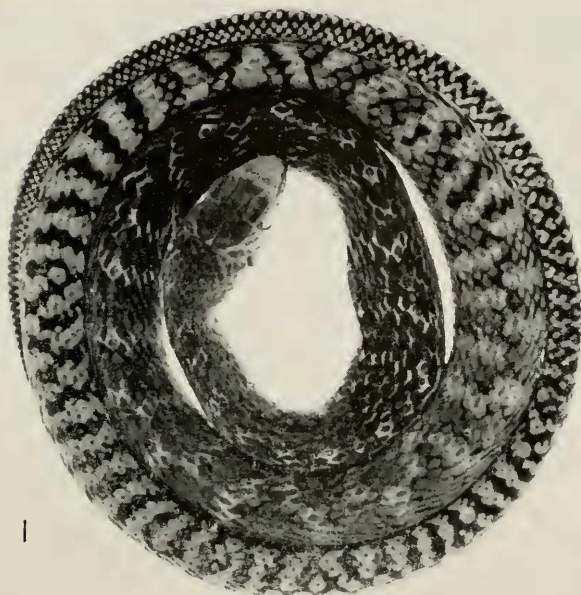
The collection contains the following specimens of this species: EHT-HMS Nos. 30696-30701, 12-13 miles north of Trincomalee, Ceylon; U.S.N.M. No. 56198, Ceylon.

These apparently agree with specimens from the mainland of India in most characters of squamation and in color markings.

The markings of the anterior part of the body are poorly defined. The skin between the scales is whitish, which color sometimes encroaches on the scales a little. Thus a whitish reticulation is evident when the scales are distended but only a trace of it is visible when scales are normally imbricated. The posterior part of body has numerous transverse black bands, the edges of which are irregular.

The character of the scale rows is unusual in this genus. The scale rows across the back part of head are 25-27, while the number of rows on the posterior part is reduced to 14. On the anterior part of the body, the scale rows are in odd numbers around the body while in the posterior part of the body they are in even numbers. This is accomplished by replacing the median single row with paired scales. In a related genus, *Zaocys*, this occurs throughout the length of the body. Even numbers of scale rows is a rare condition in snake genera. (See preceding page for table of scale data).

PLATE XV. Fig. 1. *Ptyas mucosus* (Linnaeus). EHT-HMS No. 30689 ♀; 12 miles north Trincomalee, Eastern Province, Ceylon; total length, 795 mm. Fig. 2. *Natrix piscator* (Schneider). EHT-HMS No. 30730 ♀; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 745 mm.



GENUS COLUBER Linnaeus

Coluber Linnaeus, *Systema Natura*, ed. 10, 1758, p. 216.

Genotype, *Coluber constrictor*.

Only a single species has been recorded for Ceylon.

Coluber fasciolatus Shaw

Coluber fasciplatus Shaw, *General Zoology*, vol. 3, p. 528 (Based on Russell, *An Account of Indian Serpents*, vol. 1, 1796, p. 26, pl. 21, India).

Zamenis fasciolatus Wall, *Ophidia Taprobanica*, 1921, pp. 191-195, fig. 41 (Jaffna).

No specimen in the collection.

A specimen of this species has been reported by Haly from Jaffna. Since this record may be due to faulty data, this form must be regarded as a doubtful resident of Ceylon.

GENUS LIOPELTIS Fitzinger

Liopeltis Fitzinger, *Systema Reptilium*, p. 26.

Genotype, *Herpetodryas tricolor* Schlegel.

One species occurs in Ceylon.

Liopeltis calamaria (Günther)

Cyclophis calamaria Günther, *Catalogue of the Colubrine Snakes in the Collection of the British Museum*, 1858, p. 250 (type locality, Ceylon).

Liopeltis calamaria Wall, *Ophidia Taprobanica*, 1921, p. 251, fig.; Smith, *The Fauna of British India*, *Reptilia and Amphibia*, vol. 3, *Serpentes*, 1943, pp. 184-185.

No specimen of this species is represented in the collections.

This form may be identified by the following characters: Scale formula 15-15-15; an elongate undivided nasal scale; supralabials 7-7, infralabials 7-7. The ventrals of Ceylonese specimens vary between 127-134; the subcaudals between 67-76.

Olive-green dorsally with a fine blackish line along the edge of the fifth and sixth scale rows, the line tending to break up into spots anteriorly and continuing well on the tail. Another dark line, less distinct, follows the edges of the third and fourth scale rows. Belly pale yellow. Some specimens show lighter stripes. Maximum length, 407 mm.

GENUS OLIGODON Boie

Oligodon Boie, *Isis*, 1827, p. 519.

Genotype, *Oligodon bitorques*.

The following five forms of *Oligodon* are recognized as occurring in Ceylon: *O. sublineatus*, *O. calamarius*, *O. taeniolatus fasciatus*, *O. t. ceylonicus*, and *O. arnensis*.

KEY TO THE FORMS OF OLIGODON IN CEYLON

1. Ventral scales with three brown spots forming continuous lines; small paired dorsal spots sometimes alternating; no palatine teeth, 4-6 pterygoid teeth; ventrals, ♂ 130-144, ♀ 149-160; subcaudals, ♂ 32-36, ♀ 23-30. *sublineatus*
Venter lacking distinct lines 2

2. Venter with squarish white and black spots; a median dorsal white line and 18 narrow cross bars; ventrals, ♂ 127-138, ♀ 143-152; subcaudals, ♂ 28-34, ♀ 20-24; palatine and pterygoid almost or completely edentulous. . . . *calamarius*
 Venter lacking squarish black and white spots; few pterygoid teeth. 3
 Venter white; pterygoid teeth numerous (15-17). *arnensis*
3. A more or less buff species with two broad dark-brown dorsal lines, separated by a whitish median line; a narrow dark line from mouth to vent; about 43 dim or diffuse cross bands, each preceded and followed by narrow flecks of white; venter white or flesh color; ventrals, ♂ 171-175, ♀ 184-185; subcaudals, ♂ 45-51, ♀ 44. *taeniolatus ceylonicus*
 Pale buff or yellowish brown with a median series of rather large, well-defined, rounded dark spots along back (some may be broken medially); ventrals, ♂ 158-159, ♀ 174; subcaudals, ♂ 40-46, ♀ 40. *taeniolatus fasciatus*

Oligodon arnensis (Shaw)

Pl. XVI, fig. 2; Text fig. 2

Coluber arnensis Shaw, General Zoology, vol. 3, pt. 2, 1802 (type locality, "Country of Arnee in the East Indies") (Based on Russell's Indian Serpents, vol. 2, 1796, pl. 38, Arni, N. Arcot.).

Oligodon albiventer Günther, Reptiles of British India, 1864, p. 213 (near Kandy, Ceylon).

Oligodon arnensis Smith, Fauna of British India Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 225-226, fig. 77.

Oligodon arnensis albiventer Deraniyagala, Ceylon Journ. Sci., ser. B, vol. 20, 1936, p. 89.

A single specimen referable to this species is present in the collection. This is U. S. Nat. Mus. No. 120332, collected at Peradeniya, Kandy District, Ceylon, by H. G. Deignan.

The ground color is a deep gray brown, with 17 transverse white-edged black bands, that terminate laterally on the outer scale row. The venter and most of the outer first row and part of the second row, pearly white. However there is some slight scattering of pigment on the two scale rows. Between the transverse bands are faint traces of intercalated spots. These consist of some black flecks on the sides, and occasionally a few on the back.

A pair of lines run forward from near the second ventral, crossing the angle of the mouth, and meeting on the frontal (or narrowly failing to meet). Two other lines arise on either side above the ninth ventral and run forward. These meet seven scales back of the parietal. A narrow band crosses the base of the snout, involves the eyes and reaches almost to the mouth. Dark flecks are present on the second and sixth labials.

There are eleven maxillary teeth, small anteriorly, the ninth suddenly becoming much larger, followed by two large knifelike teeth. Eight palatine teeth present followed after an interspace by 17 pterygoid teeth. There are 19 teeth on the mandible.

The ventrals number 180, subcaudals 46. The anal is divided. The scale formula is 17-17-15. Total length, 317 mm., tail, 47 mm. The type is said to have 169 ventrals and 50 subcaudals.

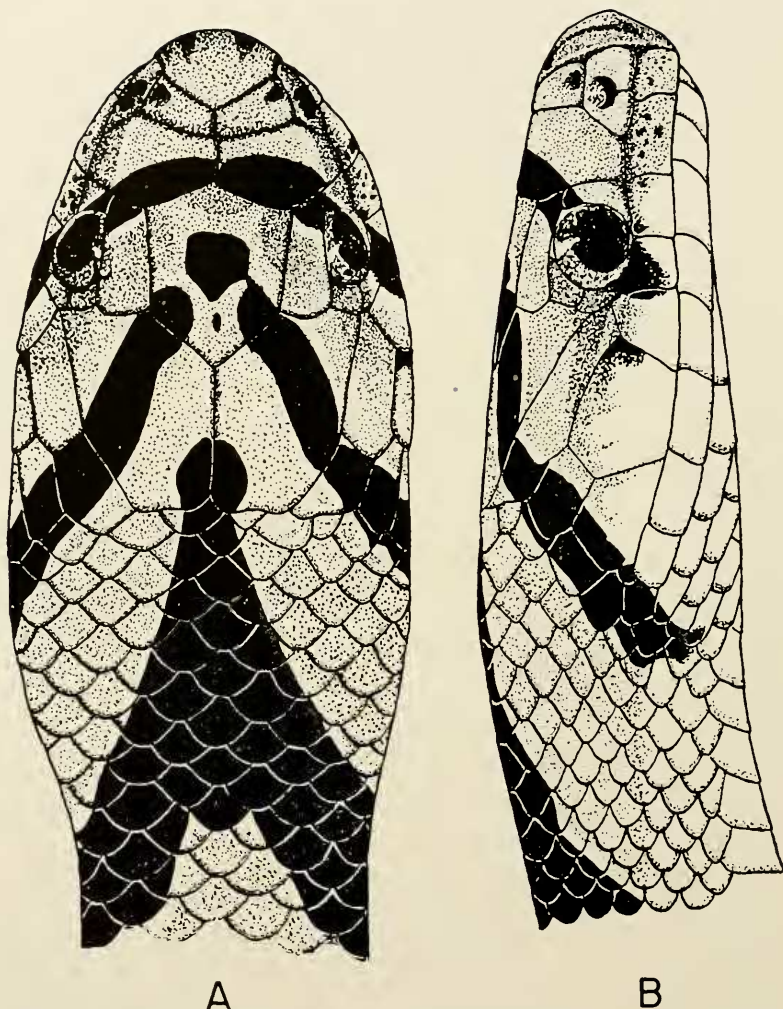
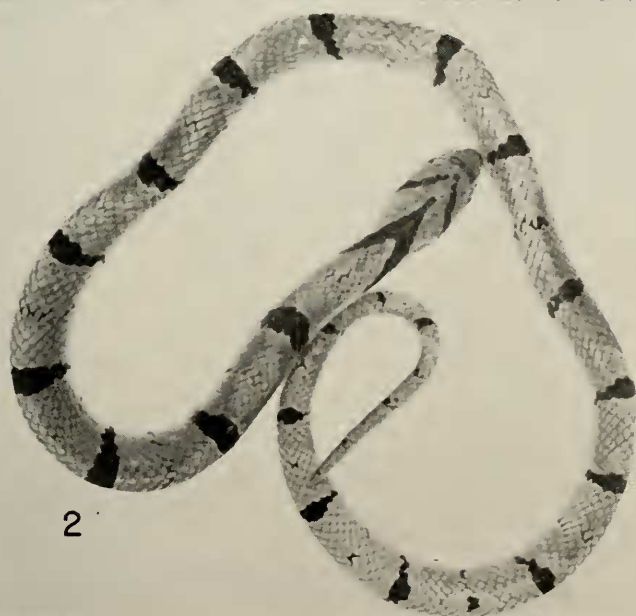
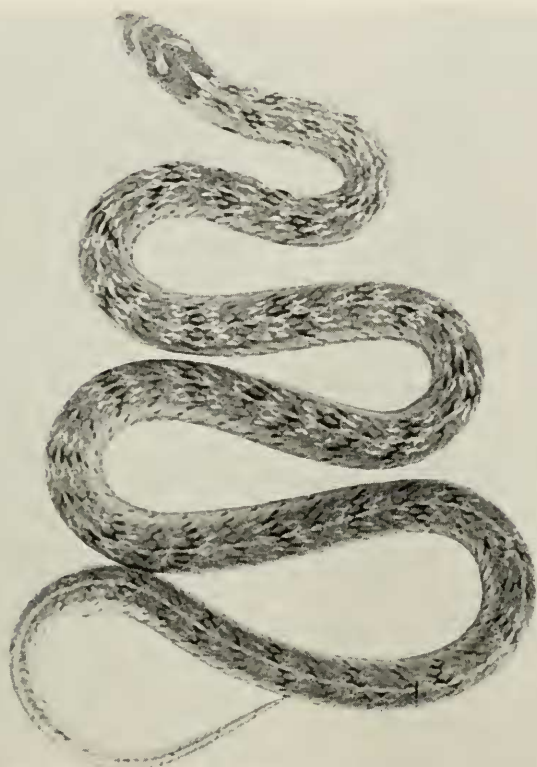


FIG. 2. *Oligodon arnensis* (Shaw), U. S. N. M. No. 120332. A. Dorsal view of head. B. Lateral view of head ($\times 10$).

There is a strong probability that Günther's name (*albiventer*) should be applied to this form. Series of specimens alone can verify the relationship.

PLATE XVI. Fig. 1. *Oligodon taeniolatus ceylonicus* Wall. EHT-HMS No. 30167 ♀; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 370 mm. Fig. 2. *Oligodon arnensis* (Shaw). U. S. N. M. No. 120332 ♀; Peradeniya, Kandy District, Central Province, Ceylon; total length, 314 mm.



Oligodon taeniolatus (Jerdon)

Coronella taeniolatus Jerdon, Journ. Asiat. Soc. Bengal, vol. 22, 1853, p. 528 (type locality, doubtful, perhaps based, at least in part, on Russell, 1796, pl. 19, p. 24 [Vizagapatam]).

Oligodon taeniolatus Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 239-245, fig. 50.

At least two subspecies occur in Ceylon: *O. taeniolatus fasciatus* Günther and *O. taeniolatus ceylonicus* Wall.

Oligodon taeniolatus fasciatus (Günther)

Oligodon fasciatus Günther, Reptiles of British India, 1864, pp. 208-209, pl. XIX, fig. D (type locality, Deccan [India]).

Oligodon taeniolatus fasciatus Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 239, 241-242.

Wall, *loc. cit.*, reports this form from Ceylon. I have seen no specimens from there. It may be recognized by the median series of rounded spots which pass down the back, some of the anterior ones being divided. Other lateral marks and small spots are present near the edge of the ventrals.

Oligodon taeniolatus ceylonicus Wall

Pl. XVI, fig. 1

Oligodon taeniolatus (variety) *ceylonicus* Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 240-247.

A series of specimens, EHT-HMS Nos. 30165-30172, from a point 12-14 miles north of Trincomalee, Ceylon, have been examined. One specimen, No. 24138, is in the Kansas University Museum of Natural History. The following table gives scale counts and measurements of the specimens.

SCALE COUNTS AND MEASUREMENTS OF *O. t. ceylonicus*

Number	Sex	Ventrals	Sub-caudals	Scale formula	Total length	Tail length
30165	♂	175	45	19-17-15	414	68
30166	♂	175	47	19-17-15	390	63
30167	♀	185	42	19-17-15	374	55
30168	♂	175	47	19-17-15	384	62
30169	♂	171	45	19-17-15	295	47
30170	♀	184	44	19-17-15	311	42.5
30171	♂	174	51	19-17-15	156	25
30172	♂	174	50	19-17-15	146	23
24138 *	(yg.)	178	36	19-15-15	151	17

* Negombo, Western Province, Ceylon.

The dorsal seven rows are dark brown, traversed by about 43 narrow, darker bands, composed of a series of black brown flecks on scales, each preceded by a series of pure white longitudinal flecks. Sometimes these areas are rather dim, and when broken medially

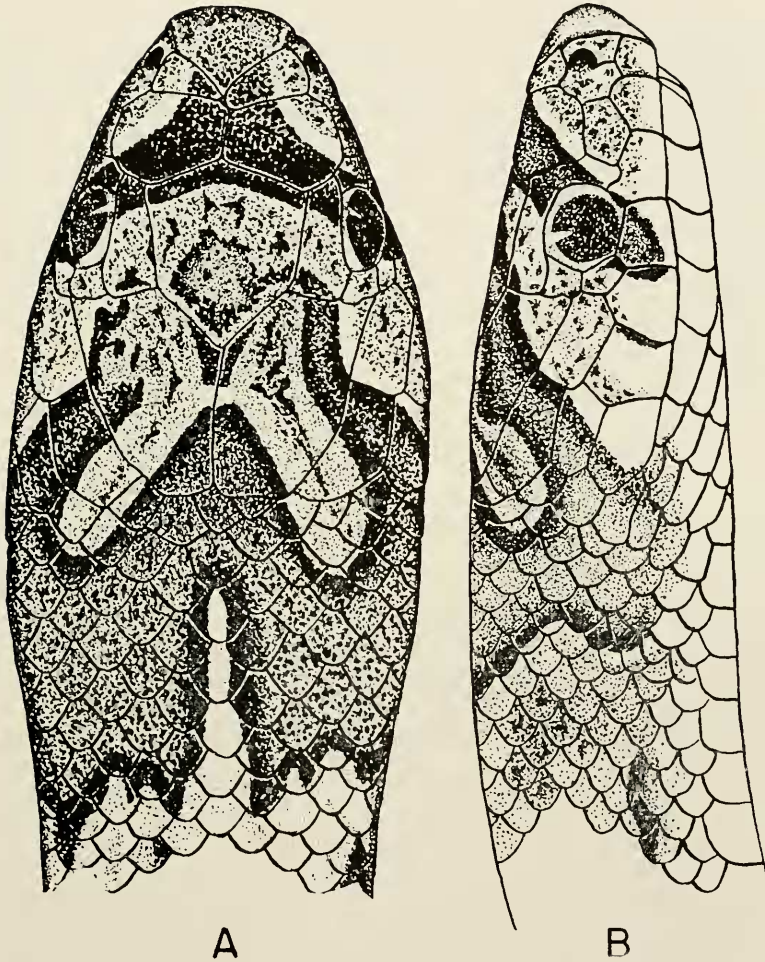


FIG. 3. *Oligodon taeniolatus ceylonicus* Wall. EHT-HMS No. 30167; 12 mi. N Trincomalee, Ceylon. ($\times 10$).

may alternate. Many of the lateral scales may have dark brown, diagonally placed flecks that tend to form lateral diagonal lines.

A well-defined dark band lies across the neck usually sending forward a median tongue and two lateral prongs which nearly enclose two elongate light areas on the back of the head; a dark band crosses the snout and involves the eyes, reaching to the commissure of the mouth. There is a suggestion of a hair-fine, median line occupying the median third of the dorsal scale row, but in none is it continuous. A dim brownish narrow line goes from angle of the

mouth to near the vent, lying largely on the second or third outer scale rows.

The venter is entirely without dark color. The outer fifth of the ventrals are creamy white. Along the edge of this color is a transparent line which together with those on other scales form a longitudinal line on each side of the ventrals. Between these lines the ventrals are flesh color.

The specimens were encountered about rocky outcrops in the forest. Usually they were found coiled under rocks lying partially on other rocks. They were very gentle, permitting themselves to be handled. They did not attempt either to bite or to escape.

The drawing shows the general disposition of head scales.

Oligodon sublineatus Duméril, Bibron and Duméril

Pl. XVII, fig. 1

Oligodon sublineatum Duméril, Bibron and Duméril, *Erpétologie Générale*, vol. 7, pp. 57-58 (type locality, Ceylon); Smith, *Fauna of British India, Ceylon and Burma* . . ., *Reptilia and Amphibia*, vol. 3, *Serpentes*, 1943, pp. 227-228.

A single specimen, U. S. Nat. Mus. No. 56330, "Ceylon," shows no divergence of significance from the typical. The presence of the dorsal narrow transverse paired spots (which frequently alternate), the three ventral lines of dots (two only on the tail) and the gray-brown dorsal coloration make this form easily recognized. It has been remarked that this form shows a marked superficial resemblance to *Callophis melanurus* (Shaw), which also occurs on the island. The following scale characters obtain in this specimen:

Ventrals, 149; subcaudals, 27; anal divided; 7 upper and 7 lower labials.

The ventral range given by Smith, *loc. cit.*, is 134-161; of subcaudals, 23-37.

Oligodon calamarius (Linnaeus)

Coluber calamarius Linnaeus, *Mus. Ad. Frid.*, 1754, p. 23, tab. 6, fig. 3; and *Systema Naturae*, 10th edition, 1754, p. 216, and 12th edition, p. 375 (*vide* Andersson, *Bihang till k. Svenska vet.-Akad. Hand.*, bd. 24, Afd. IV, No. 6, 1899, pp. 8-9) (type locality, "America" in error).

Oligodon templetoni Günther, *Ann. Mag. Nat. Hist.*, ser. 3, vol. 9, 1862, p. 57 (type locality, Ceylon); and *Rept. British India*, 1864, p. 209, pl. XIX, fig. c.

Oligodon calamarius Andersson, *loc. cit.*; Smith, *Fauna British India* . . ., *Reptilia and Amphibia*, vol. 3, *Serpentes*, 1943, pp. 228-229, fig. 78.

No specimens are in the collection. The species is known from numerous localities, occurring from the lowlands to an elevation of 3,000 to 4,000 feet.

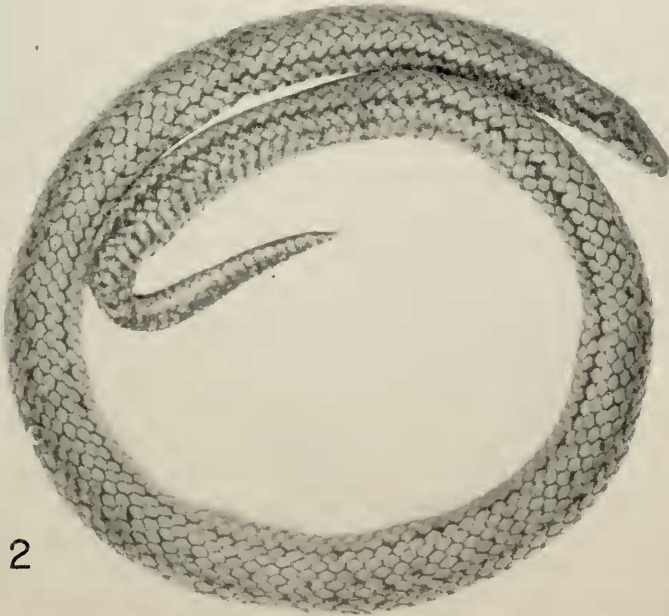


PLATE XVII. Fig. 1. *Oligodon sublineatus* Duméril, Bibron and Duméril. U. S. N. M. No. 56300 ♂; "Ceylon"; total length, 260 mm. Fig. 2. *Aspidura trachyrocta* Cope. EHT-HMS No. 30731; "Ceylon"; total length, 316 mm.

GENUS *AHAETULLA* Link

Ahaetulla Link, Beschreibung der Naturalien-Sammlung der Universität zu Rostock, vol. 2, p. 73.

Genotype, *fasciata* = *Coluber ahaetulla*.

There has been considerable confusion in the application of the generic name *Ahaetulla*.* It is apparent that the name must be applied to a group of oriental snakes rather than to a group of South American forms related but not congeneric with them. It is fitting since the name *Ahaetulla* presumably is based on a Sinhalese word.

Four species of this genus occur in Ceylon. One is here described as new. These may be differentiated by the following characters:

KEY TO CEYLONESE SPECIES OF *AHAETULLA*

- | | |
|--|------------------------|
| 1. No loreal present; scales in 15 rows; ventrals 175..... | <i>oliveri</i> |
| One or more loreals present..... | 2 |
| 2. Two loreals; scales at middle of body in 15 rows; ventrals 154-176..... | <i>bifrenalis</i> |
| One loreal; scales in either 13 or 15 rows..... | 13 |
| 3. Scale rows 13; ventrals 149-164..... | <i>caudolineolatus</i> |
| Scales in 15 rows; ventrals 163-157..... | <i>tristis</i> |

Ahaetulla bifrenalis (Boulenger)

Dendrophis bifrenalis Boulenger, The Fauna of British India, 1890, p. 338 (type locality, Ceylon).

One specimen (EHT-HMS No. 30745) of this rare species was captured 13 miles north of Trincomalee.

It may be identified by the character of the double loreal, and the relatively low ventral count (154-176) and relatively high subcaudal count (144-175). The scale formula is 15-15-11. The vertebrae are strongly enlarged, broader than the outer scale row at midbody, their posterior margin truncate or concave.

No. 30745. The nasal scale differs from that of other members of the genus occurring in the same locality. The nostril is near the middle of a large undivided scale. From the nostril a groove extends back to the anterior loreal which I suspect may actually be a very aberrant posterior nasal. The preoculars are 1-1, the postoculars 2-2. The temporals are 1 + 2 + 2 (2 + 1 + 2). Supralabials are 9-9, of which the fifth and sixth border the orbit; infralabials are 10-10, five of which border the anterior chinshield. The eye is large but its diameter is distinctly less than its distance from the nostril. The ventrals are 168, each with lateral keels. There are 145 subcaudals, all of which have keels. There is a divided anal.

* An excellent review of this by Dr. J. Oliver appears in Bull. Amer. Mus. Nat. Hist., vol. 92, 1948, pp. 167-170.

The top of the head is gray. The side of the head bears a black stripe that passes through eye to the neck. Anterior labials are pure cream save on their upper edges. A series of dashlike white marks are present on the first and second scale rows occupying only the adjacent edges of the scales. A series of dark diagonal marks pass across the anterior third of the body, none of which are wider than one scale length.

Ahaetulla oliveri sp. nov.

Pl. XVIII, fig. 1

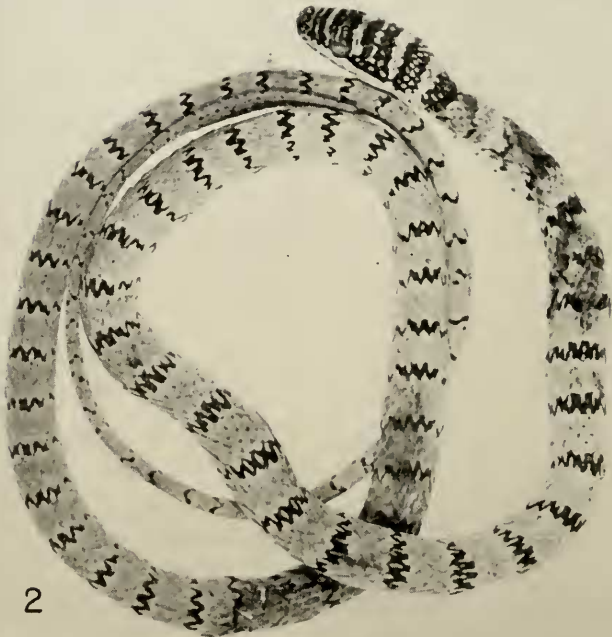
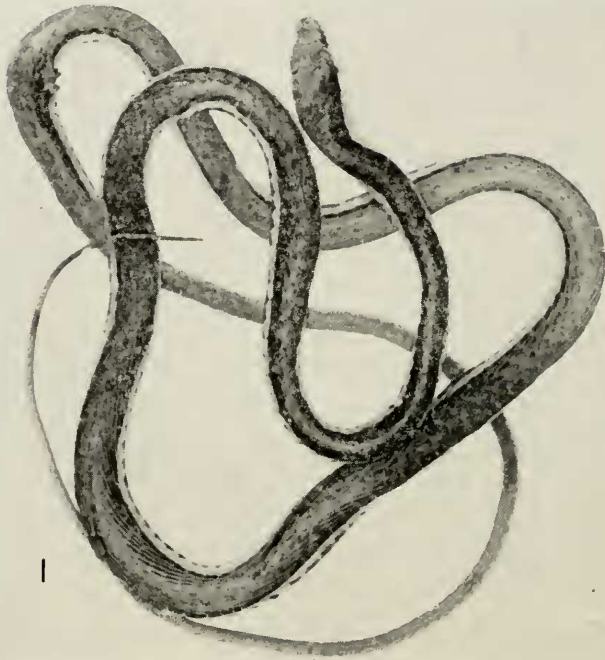
Type. EHT-HMS No. 30388 collected 12 miles north of Trincomalee, Ceylon, in 1944 by E. H. Taylor.

Diagnosis. Three labials, the fourth, fifth and sixth entering the eye; loreal absent; nasal divided at least partially; the posterior part largest and a little lower than anterior; temporals 1 + 1 + 3; vertebral scales enlarged, smaller than scales of outer row; a lateral black headstripe continues through eye and to base of tail; a white line beginning on supralabials continues on the first and second scale rows, occupying most of first and lower half of second scale row; this bordered below by a black line beginning on neck and continuing to base of tail; tail gray without stripes.

Description of species. Rostral large, its width much greater than its height, part visible above slightly angular posteriorly; internasals longer than the prefrontals but much narrower; prefrontals bordering the second to fourth supralabials; frontal equally as long as its distance from the tip of snout; parietals as long as their distance from internasals; nasal elongate, completely or almost completely divided, the posterior portion lower and larger than the anterior which contains most of nostril; one large preocular, touching frontal; two postoculars, the upper much the larger; temporals 1 + 1 + 3, the lower of the three almost below the second temporal; supralabials 9-9, the fourth to sixth bordering orbit; infralabials 10-10, five bordering first chinshields. Ventrals 173; anal divided; subcaudals divided, 134; ventrals keeled and notched on each side; subcaudals with rounded lateral ridges in lieu of lateral keels.

Color. Above bronzy gray to middle of third scale row, a cream white line bordered above and below by deep black passes on two outer scale rows to tail. Tail uniform bronzy gray. Belly cream white (in preservation the belly tends to become dark).

Measurements in mm. Total length, 756; tail, 250.



Remarks. The type specimen was taken in low forest near the beach. Its movements were moderately rapid. The species is dedicated to Dr. Jim Oliver who has contributed to the stabilization of the generic name of this form.

In 1909* Werner described a Ceylon species lacking a loreal as *Dendrophis effrenis*. This species has been referred by most subsequent writers to the synonymy of *Ahaetulla candolineolata*. Even Werner does not recognize the form in his "Gattungen und Arten der Schlangen aus der Familie Colubridae" (Zool. Jahrb., Bd. 57, 1929).

This form belongs to the section of the genus having 15 scale rows and with three instead of two supralabials entering the eye. Werner's *effrenis* belonged to the group having 13 scale rows, with two labials entering the eye.

Ahaetulla tristis (Daudin)

Coluber tristis Daudin, Histoire Naturelle des Reptiles, vol. 6, p. 430 (Based on Russell, An Account of Indian Serpents, 1796, p. 36, pl. 31).

Chrysopetea boiei A. Smith, Mag. Zool. Bot., 1836, p. 144 (Ceylon).

Dendrophis helena Werner, Zool. Anz., 1892, vol. 16, p. 8 (Ceylon).

Dendrelaphis tristis var. *taprobanensis* Wall, Ophidia Taprobanica . . . 1921, p. 221 (Ceylon).

There are seven specimens of this common species in the collections. These are EHT-HMS Nos. 30733-34; 30736-37; 30740-42, all from 12 miles north of Trincomalee.

A young specimen, U.S.N.M. 12494, differs in color characters from the others listed in having the anterior vertebral scales each with a cream spot. Each transverse, somewhat diagonal, row of scales has the posterior edge black thus forming as many narrow black lines as there are transverse scale rows; some of the scales have their lower edges dark also and together these form a series of dim diagonal transverse lines but directed obliquely backwards. This second series cannot be discerned on the second half of the body.

The two outer scale rows are largely cream but each third scale of the outer row either black-edged or with the adjacent scales black-edged so that there appears a series of black-edged yellowish cream spots. These are present only on the anterior half of body. Whether

* Mitt. Naturh. Mus. Hamburg, vol. 26, 1909, p. 221.

PLATE XVIII. Fig. 1. *Ahaetulla oliveri* sp. nov. EHT-HMS No. 30388 ♂; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 756 mm. Fig. 2. *Chrysopetea taprobanica* Smith. EHT-HMS No. 31244 ♂; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 656 mm.

this is the typical juvenile marking or whether this is an unusual condition, I cannot say.

The ventrals are 164, the subcaudals 125; the anal is divided.

Ahaetulla caudolineolata (Günther)

Dendrophis caudolincolatus Günther, Proc. Zool. Soc. London, 1869, p. 507, pl. 11, fig. 1 (type locality, Ceylon).

Dendrophis gregorii Haly, Taprobaman, 1888, vol. 3, p. 51 (Ceylon).

Dendrophis effrenis Werner, Mitt. Naturhist. Mus. Hamburg, vol. 26, 1909, p. 221 (Colombo, Ceylon).

No specimens of this species are in the collections. The species may be diagnosed by the following characters: scale rows 13-13-9; eight supralabials, the fourth and fifth bordering eye; anteriorly with diagonal dark lines; tail with four more or less distinct black longitudinal lines. Ventrals 149-164; subcaudals 119-128; anal divided.

GENUS CHRYSOPELEA Boie

Chrysopelca Boie, in Ferrusac, Bull. Sci. Nat., vol. 9, 1826, p. 237; and Isis, 1827, p. 520.

Two forms occur in Ceylon. They may be distinguished by the following key.

KEY TO CEYLON SPECIES OF CHRYSOPELEA

1. Scale preceding anal scale paired; greenish with transverse darker markings forming bands and with a median series of orange spots present..... *ornata*
Scale preceding anal scale single; light olive brown with about 62 black wavy or zigzag lines on body..... *taprobanica*

Chrysopelca ornata (Shaw)

Coluber ornatus Shaw, General Zoology, 1802, vol. 3, p. 477 (based on Russell's Ind. Serp. 2, 1801, p. 4, pl. 2; unknown type locality, but presumably India).

Chrysopelca ornata Boie, Isis, 1827, p. 546.

No specimens from Ceylon have been examined. The flower-shaped spots of orange are said to be invariably present on Ceylonese specimens.

Chrysopelca taprobanica Smith

Pl. XVIII, fig. 2

Chrysopelca taprobanica Smith, Fauna of British India, Ceylon and Burma including the whole Indo-Chinese Subregion; Reptilia and Amphibia, vol. 3, Serpentes, Dec., 1943, p. 254 (type locality, Kanthali, Ceylon).

Chrysopelca ornata (in part) of various authors.

This recently described species is represented in my collection by a single specimen (EHT-HMS No. 31244) collected 12 miles north of Trincomalee. It is surprising that the species was ever confused with *Chrysopelca ornata*, which likewise occurs on Ceylon, since the general appearance is quite different. The ground color of *taprobanica* is light olive brown with a series of 62 transverse wavy or

zigzag lines crossing the back that often break up low on the sides, and, at least in the posterior part of the body, they fail to reach to the ventrals. The greatest width of the black color is usually less than half a scale in width. These bands continue on the tail, but become indistinct towards the tip. Thirty or more can be counted. The ventrals are sharply keeled, notched laterally, and bear a broken row of black dots touching the keel. These dots are arranged in groups of three or two on contiguous scales, separated by a scale without a dot. They continue on the subcaudals but become irregular and are absent posteriorly.

When the outer epidermis is shed the color is light blue-gray. The head is black crossed by three continuous ivory-colored bands; between these are other bands made up of ivory flecks or spots and short lines. The chin and labials are ivory white.

The keels on the scales are indistinct and if the outer epidermis is shed can scarcely be discerned. The scale rows are 17-17-13. The anal is divided and the last ventral is single. The ventrals are 204; the subcaudals 110 + (the extreme tip missing).

The species is confined to Ceylon. It is known from the North Western Province (Kurunegala) and the northern part of Eastern Province (Kanthalai, and 12 mi. north of Trincomalee). It would appear to be a lowland form.

GENUS LYCODON Boie

Lycodon Boie, in Ferrusac's Bull. Sci. Nat., vol. 9, 1826, p. 238 (part); Fitzinger, Neue Class. Rept., 1826, pp. 29, 30.

Genotype, *Lycodon aulicus*.

Only three species are known to occur in Ceylon.

KEY TO THE FORMS OF LYCODON IN CEYLON

1. Eight supralabials; ventrals not angulate laterally; ventrals (Ceylon) 154-166; subcaudals, 35-50; dark brown with whitish crossbars, which widen on sides, the expansions often enclosing triangular spots; or becoming pigmented; posteriorly bars narrower and closer together; below uniform white. *striatus*
 Nine supralabials; ventrals angulate laterally; ventrals, 172-214; subcaudals, 57-80 2
2. Brown, lavender, or purplish, with white bands, which widen on the sides; labials cream without spots in their middle; diameter of eye two times in distance between eye and nostril; preocular touches frontal. *aulicus aulicus*
 Brown or lavender with a series of small, whitish, dark bordered medial spots on anterior two thirds of body; eye diameter one and one half times in distance from eye to nostril; preocular separated from frontal. *osmanhilli*

Lycodon aulicus aulicus (Linnaeus)

Pl. XIX, fig. 2

Coluber aulicus Linnaeus, Museum Adolphi Friderici regis, vol. 1, 1754, p. 29, pl. 12, fig. 2 (America); Systema Naturae, 10th ed., 1758, p. 222.

Lycodon aulicus Wall, Journ. Bombay Nat. Hist. Soc., vol. 15, 1904, p. 706; *idem.*, vol. 18, 1907, p. 112; *idem.*, vol. 19, 1909, p. 87, color pls. 344, 619; Smith, The Fauna of British India, Ceylon and Burma . . ., Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 263-266, fig. 89.

Ophites aulicus Wall, Ophidia Taprobanica, or the Snakes of Ceylon, 1921, p. 151.

This species is represented by the following specimens: EHT-HMS Nos. 30708-30713, 12 mi. N. Trincomalee, Ceylon; U. S. N. M. No. 31247, "Ceylon."

The series of specimens from near Trincomalee are uniform in pattern and seemingly all are referable to *L. a. aulicus*.

Temporal scales vary somewhat, the formula being $2 + 3 + 4$, or more frequently assuming a position of $\frac{1}{1+2} + 4$ (3). The third, fourth and fifth supralabials border the orbit, five infralabials touch the anterior chinshields, which are somewhat larger than posterior. The scale formula is 19 (anteriorly on neck), 17, 17, 15.

The head is spatulate, flattened, the rostral only slightly visible above. The nasal is at least partially divided into two nearly equal parts and the loreal is in contact with the internasal.

The color on the dorsum and sides is lavender or purplish lavender (tending to turn brown after several years of preservation), crossed by 13 narrow, cream-white lines one and one half to three scales wide, that widen on the sides and become confluent with the lighter color of the venter. The top of the head is deep lavender bordered behind by a cream transverse band that is divided by a narrow tongue of lavender. The lips are cream except on the upper edges. Older specimens develop pigment on the scales of the white bands and the white may form only a reticulum; the borders of the lavender areas may be darkened and irregular.

Wall, *loc. cit.*, has called attention to the variation occurring in Indian and Ceylon specimens. It is surprising that the series here shows very little variation in color save that normally expected with age.

PLATE XIX. Fig. 1. *Sibynophis subpunctatus* (Duméril, Bibron and Duméril) EHT-HMS No. 31252 ♀; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 355 mm. Fig. 2. *Lycodon aulicus aulicus* (Linnaeus). EHT-HMS No. 30712 ♀; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 378 mm.



TABLE OF DATA ON *Lycodon aulicus aulicus* (Linnaeus)

Number	Sex	Ventrals	Sub-caudals	Supra-labials	Infra-labials	Oculars
30708	♂	185	67	9-9	11- 9	1, 2
30709	♂	184	65	9-9	11-11	1, 2
30710	♂	180	67	9-9	11-11	1, 2
30711	♀	201	63	9-9	10-11	1, 2
30712	♀	195	56	9-9	11-10	1, 2
30713	♂	181	67	9-9	11-10	1, 2
31247	♂	185	69	9-9	11-11	1, (2-3)

Lycodon striatus (Shaw)

Coluber striatus Shaw, General Zoology, vol. 3, 1802, p. 527 (Based on Russell's, An account of Indian Serpents . . . , pl. 16).

Lycodon striatus Smith, The Fauna of British India . . . Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 261-262, Ceylon (etc.).

No specimens of this species in the collection.

It may be distinguished by the presence of only eight supralabials, and in having the anterior part of nasal larger than posterior. The rounder rather than angulate condition of the ventral scales will separate this species from *Lycodon aulicus*. The ventrals are 185, subcaudals 69 + 1; the supralabials 9-9, the infralabials 11-11.

There is a single preocular but on the left side there are three postoculars instead of two, the usual number. The arrangement of the temporals is $\frac{1}{1+2} + 4$. The third, fourth and fifth supralabials bound the orbit.

Lycodon osmanhilli sp. nov.

PL. XX

Type. K. U. M. N. H. No. 24141, Colombo, Ceylon; W. C. Osman Hill, Coll., paratype U. S. N. M. No. 19215, "Ceylon."

Diagnosis. Diameter of eye (2.9 mm.) contained in distance between eye and nostril (4.0 mm.) 1.38 times; length of frontal equal to distance between frontal and rostral; tail (101 mm.) in total length (522 mm.) 5.38 times. Ventrals angulate; nine supralabials, each with a medial black spot; a series of small, dark-bordered cream spots on anterior two thirds of body; preocular separated from frontal.

Description of type. Rostral forming a sharp transverse ridge, its width twice as great as its height, the upper part bent at nearly a right angle, rather broadly visible from above; internasals a third longer than wide forming an angular suture with the rostral; prefrontals approximately one third longer than broad, their area more than three times that of the internasals; frontal shield-shaped

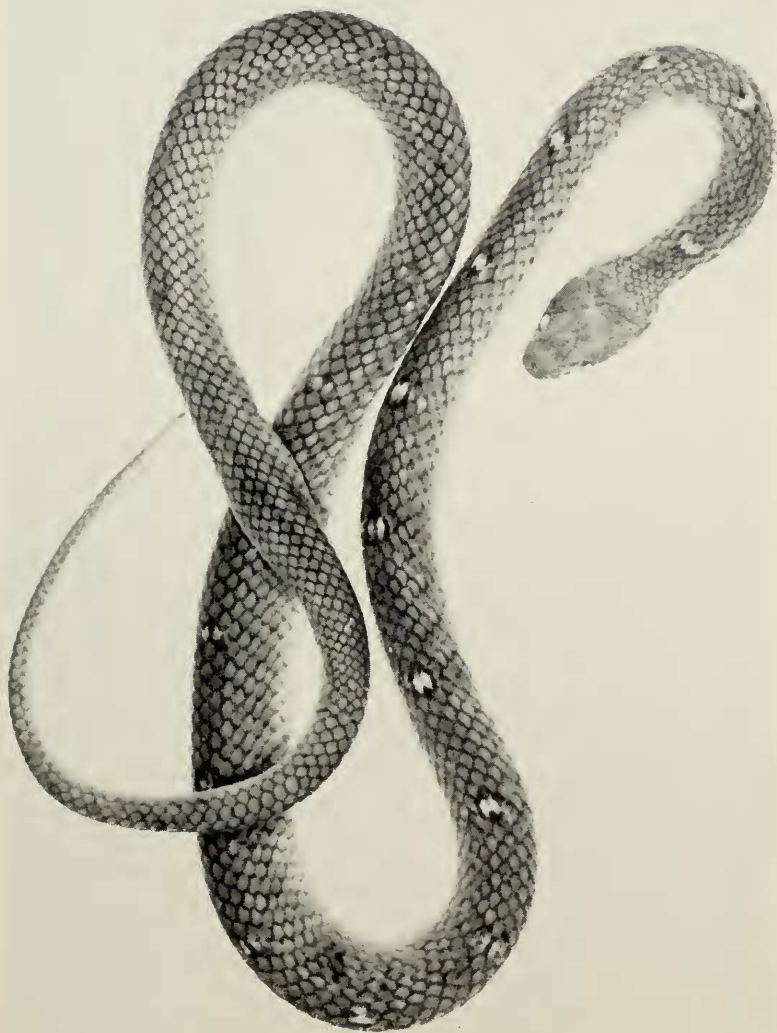


PLATE XX. *Lycodon osmanhilli* sp. nov. K. U. M. N. H. No. 24141; Colombo, Ceylon; total length, 522 mm.

nearly a third longer than wide, its length equal to its distance from rostral, and about one fourth shorter than a parietal; latter scales much narrowed posteriorly. Nasal divided, the nostril pointing upward and somewhat outward; anterior part of nasal largest; loreal elongate, more than twice as long as high; not in contact with the internasal; one preocular as high as wide, separated from frontal; two postoculars; temporals 2 + 3 + 4, those bordering the parietals not especially enlarged; supralabials 9-9, the third, fourth and fifth bordering the eye; infralabials 10-11, five bordering the first pair of chinshields, which are distinctly larger than second pair; neither the snout nor lower jaw constricted immediately in front of eye.

Across back of head 23 scale rows; on neck and body 17; in front of vent 15. Ventrals angulate, 187; anal divided; subcaudals 68. Scales smooth; single apical pits are discernible if the outer epidermis is not shed.

Color. The general color brown in alcohol, the top of head being uniform lavender brown, bordered along the upper edge of labials by a slightly darker line. All labials cream, with a darker upper edge and large dark medial spots; infralabials each with a dim darker spot; venter immaculate. Back brown with 19 cream spots covering part of three or four scales on middorsal line, each edged with dark brown; many lateral scales with very narrow white edges; latter third of body and tail lacking spots. Most of the dorsal and lateral scales are of a darker brown on their edges than in the middle.

Measurements in mm. Total length, 522; snout to vent, 421; tail, 101; greatest width of head, 10.6; greatest length of head (from jaw angle) 17.8.

Remarks. The paratype, U. S. N. M. No. 19215, is a young, perhaps somewhat faded specimen. However the general color pattern of the young is identical to that which obtains in the adult. There are 21 median white or cream spots, covering parts of four scales and completely or partially surrounded by dark brown. The dark labial spots are distinct.

The eye (as is usual in many snakes) is proportionately larger than in the adult and its diameter is only minutely less than distance between eye and nostril. The preocular is separated from the frontal, and other head scales have the general shape and proportions as those of the type.

The following scale characters are present: supralabials, 9-9; infralabials 11-11, five touching the first chinshields; one loreal; one

preocular; 2-3 postoculars; scale formula, 19-17-17-15. Ventrals, 186; subcaudals (divided) 70 (the terminal subcaudal scale equal to the length of the preceding five pairs of subcaudals); anal divided.

Comparisons. The species here treated as *Lycodon aulicus aulicus* although having a somewhat similar scale formula differs in pattern, in the size of eye, which is smaller, in the constriction of the snout in front of or at eye. The eye is contained in the nostril to eye distance more than twice, the eye being smaller and the distance greater than in *osmanhilli*. When two specimens of near equal length are compared, *Lycodon aulicus aulicus* is more robust, with a broader and a longer head. The supralabials and infralabials lack the median dark spots.

Two specimens of *aulicus*, one a little longer and one a little shorter, are compared by a series of measurements.

COMPARATIVE MEASUREMENTS OF *Lycodon osmanhilli* and *L. aulicus aulicus*

Number	Total length	Tail	Head length	Head width greatest	Eye diameter	Eye to snout tip	Eye to nostril	Tail in total length
30710	545	98	21.1	13.2	2.9	7.1	5.45	5.56
24141	522	99	17.8	10.6	2.9	5.8	4	5.38
30713	498	95	19.2	11.3	2.2	6.3	4.5	5.24

Nos. 30710, 30713—*L. aulicus aulicus* from 12 mi. N. Trincomalee.

No. 24141—Type of *osmanhilli*.

In *Lycodon aulicus aulicus* the preocular is much higher than long and is in contact with the frontal. The temporals bordering the parietals are enlarged, there being only three on each side (four in *osmanhilli*). The loreal is deeper, its width minutely less than twice in length. The length of the frontal equals distance from the frontal to the middle of the internasals. There is no significant difference between the counts of the ventrals and subcaudals in the two forms. The counts of the ventrals in males are 181-185 (186-187); subcaudals 65-69 (68-70); in the females, 195-201; subcaudals 56-63 (counts for *osmanhilli* in parenthesis).

The species is named for Dr. W. C. Osman-Hill of Edinburgh, Scotland, who has collected widely in Ceylon.

GENUS CERCASPIS Wagler

Cercaspis Wagler, Natürliches System der Amphibien, 1830, p. 91.

Genotype, *Hurria carinata* Kuhl.

Cercaspis carinatus (Kuhl)

Hurria carinata Kuhl, Beitr. Zool. Vergl. Anat., 1820, p. 95 (type locality unknown).

Cercaspis carinatus Günther, Reptiles of British India, 1864, p. 324; Wall, Spolia Zeylanica, vol. 9, 1921, pp. 399, 404; and vol. 13, 1924, p. 77; Ophidia Taprobanica, or the Snakes of Ceylon, 1921, pp. 162-165; Journ. Bombay Nat. Hist. Soc., vol. 29, 1923, p. 614; Smith,

Fauna of British India . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, p. 268-269, fig. 90 (vertebrae).

Lycodon carinatus Boulenger, Fauna British India, 1890, p. 297; and Catalogue of the Snakes in the British Museum, vol. 1, 1893, p.358.

This species resembles closely in external characters certain species of *Lycodon* but differs in an extraordinary manner in having the very greatly broadened prezygapophyses on the vertebrae. Smith (*loc. cit.*, footnote p. 267) states that this same condition is present "also in S. American *Xenopholis*."

No specimen in the collection.

GENUS DRYOCALAMUS Günther

Dryocalamus Günther, Catalogue of the Colubrine Snakes in the Collection of the British Museum, 1858, p. 121.

Genotype, *Dryocalamus tristrigatus*.

Two species occur in Ceylon, neither of which is endemic.

KEY TO THE CEYLON FORMS OF DRYOCALAMUS

Scales in 13 rows; one or two preoculars; nasal undivided or partially divided. . . . *nympha*

Scales in 15 rows; one preocular; nasal divided more or less completely. *gracilis*

Dryocalamus nympha (Daudin)

Coluber nympha Daudin, Histoire Naturelle des Reptiles, 1803, vol. 6, p. 244, pl. 75.

Dryocalamus nympha Boulenger, Catalogue of the Snakes in the British Museum, vol. 1, 1893, p. 370.

No specimens in the collections.

These smooth-scaled snakes reach a length of about half a meter. The nasal is not or only partially divided below the nostril. The scale formula is 13-13-13. The head is flattened and distinctly wider than the body. Ventrals 200-236; subcaudals 65-88.

Dryocalamus gracilis (Günther)

Adontomus gracilis Günther, The Reptiles of British India, 1864, p. 234 (type locality, Anamally Hills).

Dryocalamus gracilis Boulenger, Catalogue of the Snakes in the British Museum, vol. 1, 1893, p. 371.

No specimens in the collection.

In this species the nasal shield is more or less completely divided. The loreal is in broad contact with the orbit and has usually a small preocular above it bordering orbit. The scale formula is 15-15-15. Ventrals 199-243; subcaudals, 75-87.

GENUS NATRIX Laurenti

Natrix Laurenti, Specimen Medicum, exhibens Synopsis Reptilium emendatum, 1768, p. 73.

Genotype, *Natrix vulgaris* = *Coluber natrix* Linnaeus.

Three forms are known to occur in Ceylon. These may be differentiated by the following key.

KEY TO CEYLON SPECIES OF NATRIX

1. Posterior maxillary teeth enlarging gradually; no dorsolateral buff stripes; two diagonal lines below and behind eye..... 2
 The last two or three posterior maxillary teeth abruptly enlarged; usually buff dorsolateral stripes present, more distinct posteriorly; no diagonal lines below and behind eye..... *stolata*
2. Anterior half of body pale olive or reddish, with two series of more or less distinct alternating large roundish or rhomboidal, dark olive or brown, black-edged spots, which are partly confluent on the vertebral line (sometimes forming a sinuous band); posterior part of body of uniform color or with longitudinal rows of dark spots; 2 diagonal lines below and behind eye; ventrals, 131-146; subcaudals, 83-90 *asperrimus*
 Anterior half of body with a dim black-edged nuchal band, followed by a median darker spot with a lighter center; behind this six series of irregular darker spots arranged in longitudinal lines, the individual spots often dim and often confluent; series of narrow vertical light spots sometimes confluent on the median line. Ventrals, 131-140; subcaudals, 78-90..... *piscator piscator*

Natrix asperrimus (Boulenger)

Pl. XXI, fig. 1

Tropidonotus asperrimus Boulenger, Ann. Mag. Nat. Hist., ser. 6, vol. 7, 1891, p. 281; and Catalogue of the Snakes in the British Museum, vol. 1, 1893, p. 232, pl. 15, fig. 2 (type locality, Ceylon).

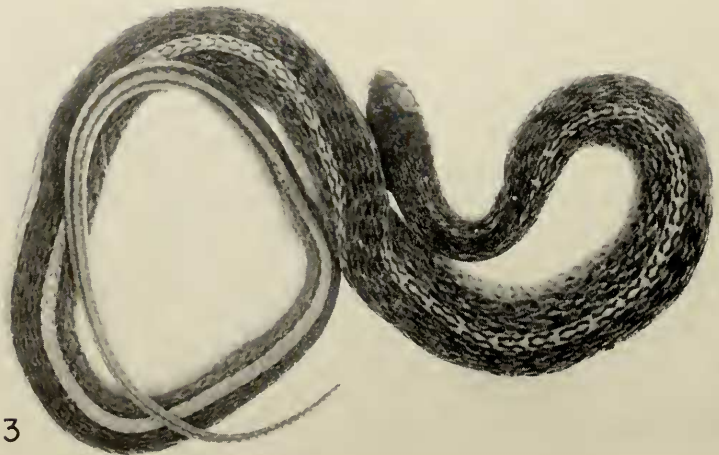
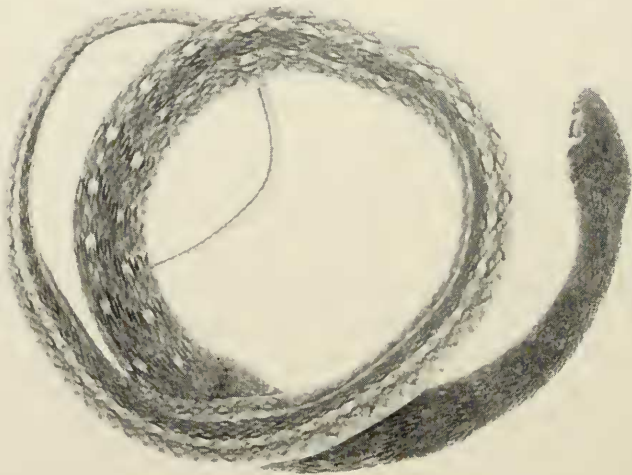
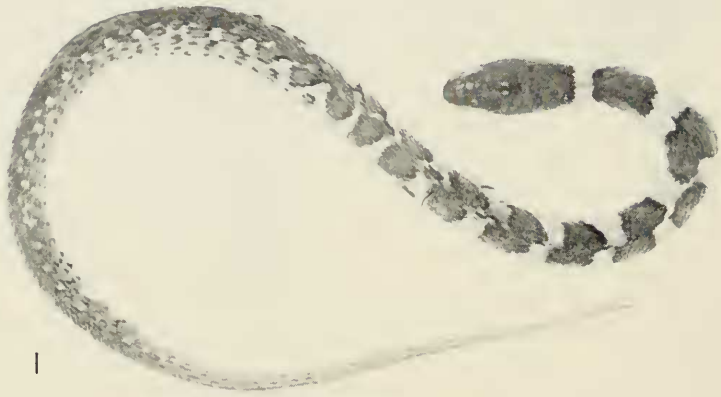
Natrix piscator asperrimus Smith, The Fauna of British India . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, p. 296.

Two specimens (U. S. N. M. Nos. 120329-30) are present in the collections. The form may be recognized by the characters presented in the Key.

Unless it can be shown that in Ceylon *piscator* and *asperrimus* have ranges distinct from each other and show intergradation, I regard it as necessary to consider them distinct species, as proposed by Boulenger.

The head of No. 120329 is dark blackish brown to black, the color continuing about nine scale lengths behind the parietals; the whitish nuchal band is three scales wide on the middorsal line, then widens on the sides and becomes confluent with the ventral coloration. A pair of diagonal lines are under eye, enclosing a white area, the upper being continued as a border on the dark spot of the head, the other is traceable across the jaw. A series of dashlike black marks are present on the edges of the ventrals and the first scale row. The series of dorsal spots are separated by transverse light bars for nearly half the length of the body. Posteriorly the large spots gradually disappear, and a few narrow indistinct dark markings can be discerned together with a series of very small white spots present on each side to the tail. The subcaudals are bordered by a black line. Ventrals 133; subcaudals 72.

No. 120330 has become nearly unicolor but some trace of the markings are visible when submerged in water.



Natrix piscator (Schneider)

Pl. XV, fig. 2

Hydrus piscator Schneider. *Historia Amphibiorum naturalis et literaria*, vol. 1, 1799, p. 247 (Based on Russell's, *An Account of Indian Serpents*, pl. 33).

Natrix piscator piscator Smith. *Rec. Indian Mus.*, vol. 42, 1940, p. 483; and *The Fauna of British India . . . Reptilia and Amphibia*, vol. 3, *Serpentes*, 1944, p. 295.

Smith, in his recent *Fauna of British India*, does not consider this species or subspecies as occurring in Ceylon. A series of specimens, Nos. 20724-20728, 30730, which I collected 12 miles north of Trincomalee, are referred to *Natrix piscator* and seemingly are more closely related to the typical form than to any other as regards the pattern. One specimen, No. 30729, was collected between Anuradapura and Colombo, about 50 mi. S of the former city.

TABLE OF DATA ON *Natrix piscator*

Number	Sex	Ventrals	Sub-caudals	Supra-labials	Infra-labials	Pre-ocular	Post-oculars
30724	♀	139	85	9-9	10-10	1-1	3-3
30725	♀	139	53 +	9-10	11-10	1-1	3-3
30726	yg.	131	47 +	9-9	10-10	1-1	3-3
30727	♀	138	87	9-9	11-10	1-1	3-3
30728	♀	140	83	9-9	10-10	1-1	3-3
30729	♂	134	90	9-9	11-10	1-1	3-3
30730	♀	136	78	9-10	10-10	1-1	3-3

The pattern of dorsal spots is distinct in certain specimens, less so in others. In all, the spots are more or less contiguous, and not of solid color. The black usually outlines three or four scales whose centers are much lighter. The small narrow vertical white spots (never as wide as one scale length) are present on the sides of all the specimens, usually as far as the base of the tail. They can be discerned even when the pattern of dark spots is indistinct. In one specimen the white spots tend to meet on the middorsal line, and they are least conspicuous in the specimen from the western side of the island south of Anuradapura.

PLATE XXI. Fig. 1. *Natrix asperimus* (Boulenger). U.S. N. M. No. 120329; Nandana Estate, Kandy District, Central Province, Ceylon; total length, 252 mm. Fig. 2. *Natrix stolata stolata?* EHT-HMS No. 30706 ♀; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 415 mm. (tail light below). Fig. 3. *Natrix stolata stolata* (Linnaeus). EHT-HMS No. 30705; Kandy, Central Province, Ceylon; total length, 440 mm.

Natrix stolata stolata (Linnaeus)

Pl. XXI, figs. 2 and 3

Coluber stolatus Linnaeus, *Systema Naturae*, 10th ed., 1758, p. 219 (type locality, Asia).*Natrix stolata* Smith, *The Fauna of British India* . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 303-305.

Three specimens in the EHT-HMS collection from Ceylon: No. 30705 from Kandy; Nos. 30706-07 from 12 mi. N of Trincomalee.

The specimen from Kandy, Ceylon, is gray (brownish gray before loss of the epidermis), the edges of some of the scales and the intervening skin between some of the scales whitish. Near the head a lighter line begins on each side covering approximately half of the fifth and seventh scale rows and all of the sixth row on the anterior two thirds of the body. Posteriorly the stripe is on the fourth, fifth and sixth rows to the vent. The stripe continues to the tip of the tail. Anteriorly the scales of the stripe are dark edged and a chain-like pattern is in evidence on the white stripe; posteriorly the dark markings are lacking on the stripe. A black dot is present on the outer edge of the ventrals on the anterior half of the body. Between the stripes there is a series of transverse dark markings having irregular edges (these are continued below the dorsolateral line). The ventrals are ♂ 143, the subcaudals 77 with possibly a few more missing from the tip.

The specimens from Trincomalee differ from the specimen described in having the dorsolateral light line indistinct throughout the anterior part of body but beginning one or two headlengths behind the head is a series of buff spots slightly darker edged which continue back two thirds the length of the body. Posteriorly the stripe is more distinct but considerable pigment is scattered on the scales of the stripe and the lateral spots are more or less indicated. Darker markings between the stripes can be discerned with difficulty. A second row of lighter spots can be discerned on the outer scale row. These also are bordered with darker color. The dark marks on outer edge of the ventrals appear on only a few scales. The markings on the sides of the head consist of a vertical light line in front of and behind eye. The labials are cream with dark linear spots on the first six that tend to border the sutures.

The scales of Nos. 30706 and 30707 are respectively: ventrals, 125, 126; subcaudals, 66, 69.

The specimens are insufficient in number to determine whether these differences of color are constant and whether there is as large a constant difference in the ventrals and subcaudals as is here indicated (maximum 25 ventrals and subcaudals). Usually females have

a larger number of ventrals and the count of males of the lowland form will probably be even less than the low figures here given for the females.

GENUS *BALANOPHIS* Smith

Balanophis Smith, Proc. Zool. Soc. London, 1938, p. 583.

Genotype, *Tropidonotus ceylonensis* Günther.

One species known, endemic in Ceylon.

Balanophis ceylonensis (Günther)

Tropidonotus chryrsargus ceylonensis Günther, Catalogue of the Colubrine Snakes in the Collection of the British Museum, 1858, p. 71 (type locality, Ceylon).

Balanophis ceylonensis Smith, Proc. Zool. Soc. London, 1938, p. 538; and The Fauna of British India . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 310-311, fig. 98, A and B.

This rare snake has a series of 24-26 maxillary teeth followed by two enlarged grooved fangs. It may be diagnosed by the following characters. Scales in 19 rows, all except outer row with keels; two preoculars, three postoculars; eight supralabials, four infra-labials touching first pair of chinshields; ventrals, 131-141; subcaudals, 40-54; anal divided. Olive brown above, with more or less distinct reticulated, black cross bars, enclosing a dorsolateral series of large yellow or reddish black-edged spots. A dark brown stripe from behind eye on neck; skin between scales scarlet, the color evident when the snake inflates its body.

GENUS *MACROPISTHODON* Boulenger

Macropisthodon Boulenger, Catalogue of the Snakes of the British Museum (Natural History), vol. 1, 1893, p. 265.

Genotype, *flaviceps*.

Only one of the four species of the genus is found in Ceylon. It is also distributed widely in India.

Macropisthodon plumbicolor (Cantor)

Pl. XIII, fig. 2

Tropidonotus plumbicolor Cantor, Proc. Zool. Soc. London, 1839, p. 54 (type locality, Malwa [Saugor], Central India).

Macropisthodon plumbicolor Boulenger, Catalogue of the Snakes in the British Museum (Natural History), vol. 1, 1893, pp. 267-268; Smith, Fauna of British India, Ceylon and Burma, including the whole Indo-Chinese subregion; Reptilia and Amphibia, vol. 3, Serpentes, pp. 314-316, fig. 99, A and B.

I obtained a single specimen in second growth forest 12 miles north of Trincomalee (EHT-HMS No. 30681). The scale formula is 27, (head), 23, 23, 17. There are 151 ventrals and 34 subcaudals, and the anal is divided. There is only a single preocular, the loreal entering the eye. There are three postoculars present and the temporals

are 2 + 3. The fangs of this form are very greatly enlarged and are directed backwards in the mouth.

The color in life was nearly uniform dull green above with some suggestion of darker bands on the anterior part of the body. On distending the skin these are well defined. Light pinkish areas are discernible on the sides on the anterior half of the body. The two outer scale rows are lighter than the others. The belly is uniform light cream with a minute dusting of darker pigment on the outer part of the ventrals. The specimen is a female.

The range of ventrals and caudals for Ceylon specimens given by Smith (*loc. cit.*) is: ventrals, 153-154; subcaudals ♂ 40-45; ♀ 37-47 based on 5 Ceylon specimens. The young are strongly marked with a V-shaped spot on the neck, followed by an area of bright orange. Numerous black bars run across the body and tail. The species is rare in the plains regions, but is encountered frequently in the mountains. Its range extends to an elevation of 7,000 feet.

GENUS ATRETIUM Cope

Atretium Cope, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 299.
Genotype, *schistosum*.

Atretium schistosum (Daudin)

Coluber schistosus Daudin, Histoire Naturelle des Reptiles, vol. 7, 1803, p. 132 (Based on Russell's An Account of Indian Serpents, vol. 2 pl. 4).

Atretium schistosus Günther, Reptiles of British India, 1864, p. 273.

This species may be recognized easily by the fused internasals, valvular nostrils directed more or less upward, scales keeled without apical pits, one preocular, two or three postoculars, eight or nine supralabials, the scale formula 19-19-17 all more or less distinctly keeled, strongly so on posterior part of body. Ventrals 129-160; subcaudals 53-85. Anal divided.

No specimens in the collection.

GENUS ASPIDURA Wagler

Aspidura Wagler, Natürliches System der Amphibien, 1830, pp. 132, 191.
(Genotype, *brachygorros* Boie.)

This genus has long been regarded as confined to Ceylon. However, Laidlaw* reports the species in the Maldive Archipelago. It is not impossible, if the data are correct, that the species has been introduced from Ceylon, since it is the snake species most common in that island and in places it is reported as "exceedingly common."

* Laidlaw, in Gardiners, The Fauna and Geography of the Maldive and Laccadive Archipelagoes, vol. 1, pt. 2, 1902, Amphibia and Reptilia, pp. 119-122.

KEY TO THE SPECIES OF ASPIDURA

- | | |
|--|---------------------|
| 1. Scales in 15 rows; a preocular present..... | <i>trachyprocta</i> |
| Scales in 17 rows..... | 2 |
| 2. Two postoculars touching the parietal..... | 3 |
| Upper postocular touching the parietal; a preocular; snout pointed; subcaudals single | <i>guntheri</i> |
| 3. A preocular present; supraocular more than half length of frontal; snout rounded, | |
| No preocular | <i>brachyorrhus</i> |
| | 4 |
| 4. Supraocular not half length of frontal; snout rounded; subcaudals undivided (usually) | <i>copii</i> |
| Supraoculars more than half length of frontal; snout pointed; subcaudals paired, | |
| | <i>drummondhayi</i> |

Aspidura drummondhayi Boulenger

Aspidura drummond-hayi Boulenger, Spolia Zeylanica, vol. 2, 1904, p. 95, pl. — (type locality, Balangoda district, Ceylon); Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 213-214; Journ. Bombay Nat. Hist. Soc., vol. 29, 1923, p. 611; Smith, The Fauna of British India, Ceylon and Burma including the Whole of the Indo-Chinese subregion; Reptilia and Amphibia, vol. 3, Serpentes, Dec., 1943, p. 338.

No specimens examined.

Aspidura trachyprocta Cope

Pl. XVII, fig. 2

Aspidura trachyprocta Cope, Proc. Acad. Nat. Sci. Philadelphia, 1860, pp. 75-76 (type locality, Ceylon); Günther, Reptiles of British India, 1864, p. 203, pl. 18, figs. F, F'; Boulenger, Fauna of British India including Ceylon and Burma, Reptilia and Batrachia, 1890, p. 290; and Catalogue of the Snakes of the British Museum (Natural History), vol. 1, 1893, p. 313; Fletcher, Spolia Zeylanica, vol. 5, 1908, p. 98; Wall, Ophidia Taprobanica or the Snakes of Ceylon, Colombo, 1921, pp. 209-213; Smith, Fauna of British India, Ceylon and Burma, including the whole Indo-Chinese subregion; Reptilia and Amphibia, vol. 3, Serpentes, p. 337, fig. 106.

Five specimens, U. S. Nat. Mus. Nos. 19214 Juv. and 56150 ♀ "Ceylon"; EHT-HMS Nos. 31245 ♂ and 31246 ♀ "Ceylon"; and K. U. M. N. H. No. 24139 ♂ Nuwara Eliya, Ceylon, are at hand, all falling within the limits of variation of the species.

The type specimen according to Cope's description has two unusual characters: a central plate separating the second chinshields, and a small central postanal plate. These characters at least are lacking in the specimens at hand. The characters of the scales on the sides of the anal plate, and the postanal plates do vary however. In one, No. 31245, there is a small pair of scales inserted between the outer part of the anal plate and the ventral scale preceding; on each side of the anus, and partly concealed by the anal plate are four scales, increasing in size posteriorly. However the pairs fail to meet. The first postanal is large and single. Towards the end of the tail there are two divided subcaudals. In the female, No. 31246, the four scales border the side of the vent, but the last pair is in contact; the intercalated scale between the anal and the preceding ventral is present on one side only. In No. 56150 there are no intercalated scales, and but three scales border the vent, the last

pair not in contact behind the anus. The first two subcaudals are divided. The females lack the clawlike keels or tubercles on the lateral scales preceding and following the vent.

The ventral and subcaudal counts for Nos. 19214 Juv., 31245 ♂, 31246 ♀, and 56150 ♀, respectively, are: 142-23; 141-20; 135-13; 143-16.

These small snakes may be easily recognized by the sharp snout, with a single internasal. The rostral is very small and is visible above only as a point. The nostril is pierced between two nasals and the first labial. The scale formula is 15-15-15.

No. 31246 ♂ has a single median discontinuous line and a median ventral irregular series of dark brown spots.

Nos. 56156 ♂ and 31245 ♂ have two or three or more irregular series of small blackish dorsal spots. A brownish line passes back from eye on to the neck. The venter of the second specimen has considerable pigment scattered across each scale and not forming discrete spots.

No. 24139 is dark, nearly uniform bluish black with a row of eight spots on the third scale row; the belly is light (red or yellow in life?) with very numerous quadrangular black spots varying in size.

Whether the black specimen is racially distinct from the remainder listed, I do not know. The cephalic scale pattern is faithfully duplicated in all. The rostral from Nuwara Eliya is truncate above while in the others it is pointed and touching the fused internasal at a single point. Unfortunately the provenance of the other specimens are unknown.

Aspidura brachyorrhus (Boie)

Scytale brachyorrhos Boie, Isis von Oken, 1827, p. 517.

Aspidura brachyorrhos Boulenger, Fauna British India including Ceylon and Burma, Reptilia and Batrachia, London, 1890, p. 288; Catalogue of the Snakes in the British Museum (Natural History), vol. 1, 1893, p. 311; Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 204-207, fig. 43; and Journ. Bombay Nat. Hist. Soc., vol. 29, 1923, p. 611.

Calamaria scytale Schlegel, Essai sur la Physionomie des Serpens, vol. 2, 1837, p. 42 (based on Boie's *Scytale brachyorrhos*).

No specimens examined.

Aspidura guentheri Ferguson

Aspidura guentheri Ferguson, Proc. Zool. Soc. London, 1876, p. 819 (type locality, Coast of the West Province, Ceylon); Boulenger, Fauna British India, including Ceylon and Burma Reptilia and Batrachia, 1890, p. 290; and Catalogue of the Snakes in the British Museum, vol. 1, 1893, p. 312, pl. 20, fig. 3; Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, p. 208-209; and Journ. Bombay Nat. Hist. Soc., vol. 29, 1923, p. 611; Smith, Fauna British India, Ceylon and Burma including the whole of the Indo-Chinese subregion; Reptilia and Amphibia, vol. 3, Serpentes, Dec., 1943, p. 338.

No specimens at hand.

Aspidura copii Günther

Aspidura copii Günther, Reptiles of British India, 1864, p. 203, pl. 18, fig. E (type locality, Ceylon); Boulenger, Fauna British India including Ceylon and Burma, Reptilia and Batrachia, 1890, p. 289; and Catalogue of the Snakes of the British Museum (Natural History), vol. 1, 1893, pp. 311-312; Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 207-208; and Journ. Bombay Nat. Hist. Soc., 29, 1923, p. 611; Smith, Fauna British India . . . Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 336-337.

No specimens at hand.

GENUS HAPLOCERCUS Günther

Haplocercus Günther, Catalogue of the Colubrine Snakes in the Collection of the British Museum, 1858, p. 290.

Genotype, *ceylonensis*.

A single recognized form is endemic in Ceylon. It is said to be common in certain highland districts.

Haplocercus ceylonensis Günther

Haplocercus ceylonensis Günther, Catalogue of the Colubrine Snakes in the Collection of the British Museum, 1858, p. 14 (type locality, Ceylon); and Reptiles of British India, 1864, p. 204, pl. XVIII, fig. G; Boulenger, Fauna of British India including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 291; and Catalogue of the Snakes in the British Museum (Natural History), vol. 1, 1893, pp. 309-310; Wall, Journ. Bombay Nat. Hist. Soc., vol. 29, 1923, p. 610, and Ophidia Taprobanica or the Snakes of Ceylon, 1921, p. 143-146, fig. 33; Smith, Fauna of British India, Ceylon and Burma including the whole of the Indo-Chinese subregion; Reptilia and Amphibia, vol. 3, Serpentes, Dec., 1943, pp. 340-341, fig. 109.

Aspidura carinata Jan. Arch. Zool., 1862, 2, p. 30; and Elenco Sistematico Degli Ofidi, 1863, p. 35; and Iconographie Générale des Ophidiens, livr. 13, 1865, pl. 1, fig. 5 (type locality, Ceylon).

Aspidura ceylonensis Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, p. 143.

A single Ceylonese specimen, U. S. Nat. Mus. No. 5896 lacks exact locality data. In color and pattern it agrees with Günther's excellent figure (*loc. cit.*), and falls within the known limits of variation of the species. The ventrals are 204, the anal single, the subcaudals 44.

The relationship of this genus is apparently with *Aspidura*. However much the resemblance with that genus, the differences are such as to warrant the separation into a separate genus. The variation in the ventral count is high—277 to 307; while the variation in the subcaudals is 37-56. The females have a ventral range 192-207; subcaudals, 37-50; males, ventrals 177-180; subcaudals 42-56. The greatest variation in number of scales is between a male* with a ventral-subcaudal count of 219 scales and a female with 257, representing a total difference of 38. It is possible that so large a difference is indicative of racial differentiation.

* Boulenger Catalogue, *loc. cit.*, p. 310.

GENUS *BOIGA* Fitzinger

Boiga Fitzinger, Neue Class. Rept., 1826, pp. 29, 30, 60.

Genotype, *Coluber irregularis* Merrem.

Five forms of the genus are known to occur in Ceylon:

KEY TO THE CEYLONESE SPECIES OF *BOIGA*

1. Three preoculars; scale rows 19 at midbody reducing to 15 near vent; 4th and 5th labials enter orbit; length, 2 feet (?). *barnesi*
One preocular; scales 19-27 at midbody; 3d, 4th and 5th labials enter orbits. 2
2. Scales in 19-21 rows; head color variable. 3
Scales in 25-27 rows at midbody; a medial and two lateral stripes on the head; length, 7 ft. *forsteni*
3. Scales in 21 rows reducing to 15 posteriorly; vertebrals enlarged but slightly, *trigonatus*
Scales in 19 rows reducing to 15 (13) posteriorly; vertebrals large, nearly as broad as long 4
4. Head powdered brown without spots; total ventrals and subcaudals, 362-390; length, 3.5-4 ft. *beddomei*
Head with dark markings; total ventrals and subcaudals, 311-342; length about 4 ft. *ceylonensis*

Boiga barnesi (Günther)

Dipsas barnesi Günther, Proc. Zool. Soc. London, 1869, p. 506, pl. xl, fig. 2 (type locality, Ceylon).

Boiga barnesi Smith, Fauna of British India, Ceylon and Burma . . .; Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 354-355.

A rare species in Ceylon. Smith states that it is known only from two specimens. Ventrals 208-220; caudals, 98-100.

Boiga trigonata (Schneider)

Coluber trigonatus Schneider, in Bechstein, transl. Lacépède, vol. 4, 1802, p. 356, pl. xl, fig. 1 (type locality, Vizagapatam, India).

Boiga trigonata Nikolski, Faune de la Russie, 1916, p. 187, pl. VI (*trigonatum*); Smith, Fauna of British India . . .; Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 349, 350, figs. 111, a-d.

Known only from Uva province in Ceylon.

Boiga beddomei (Wall)

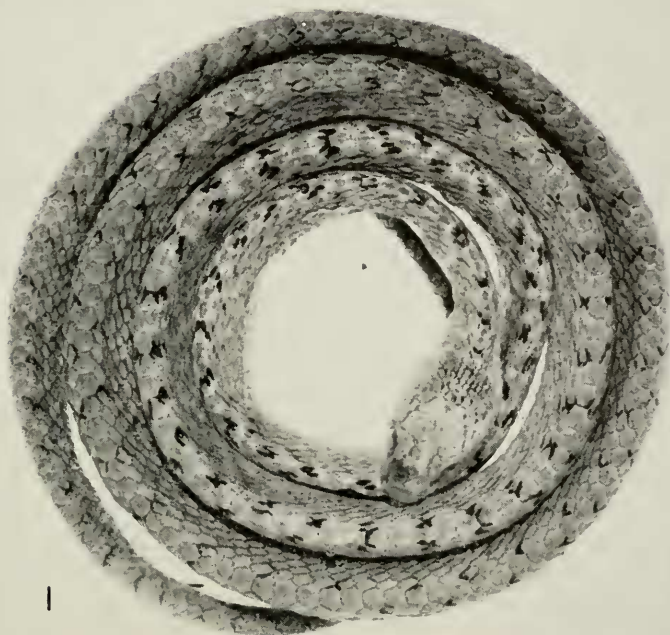
Pl. XXII, fig. 1

Dipsadomorphus beddomei Wall, Records of the Indian Museum, 1909, p. 152; and Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 282-283 (type locality, Ceylon).

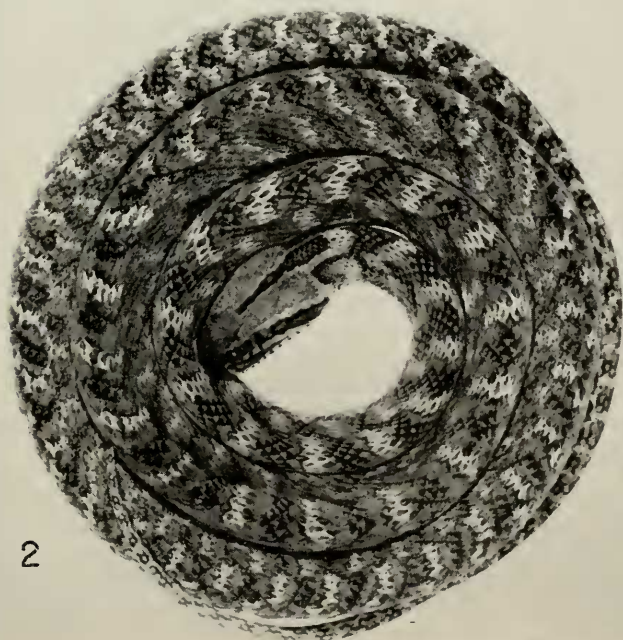
Boiga ceylonensis Smith, The Fauna of British India, Ceylon and Burma . . .; Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 351-353.

Two specimens (EHT-HMS Nos. 30674-75) were captured 12 miles north of Trincomalee, Ceylon. The first was collected from under the bark on a standing, dead tree at an elevation of eight feet

PLATE XXII. Fig. 1. *Boiga beddomei* Wall, EHT-HMS No. 30675 ♂; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 1,190 mm. Fig. 2. *Boiga forsteni* Duméril, Bibron and Duméril. EHT-HMS No. 30676 ♂; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 1,130 mm.



1



2

from the ground. The second was obtained at night crawling along the foundation of a building.

The specimens seem to be placed properly in this species. The young specimen, No. 30674, was pinkish-fawn in life with diagonal grayish markings on the sides. On the median dorsal surface are small deep black spots tending to become paired, although occasionally they are distinctly alternating. A dim dark line is present from the eye to the mouth angle. The belly is light, peppered sparsely with grayish, occasionally tending to form spots on the outer ventrals, in the latter half of body.

Boiga ceylonensis (Günther)

Dipsadomorphus ceylonensis Günther. Catalogue of the Colubrine Snakes in the Collection of the British Museum, 1858, p. 176 (type locality, Ceylon).

Boiga ceylonensis Smith. Fauna of British India, Ceylon and Burma . . .; Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 351-353.

This species occurs in India as well as in Ceylon. No specimens are in the collections.

Boiga forsteni (Duméril, Bibron and Duméril)

Pl. XXI, fig. 2

Triglyphodon forsteni Duméril, Bibron and Duméril. Erpétologie Générale, vol. 7, 1854 pp. 1077-1078 (type locality unknown).

Dipsas forsteni Günther, Reptiles of British India, 1864, p. 309; Anderson, Proc. Zool. Soc. London, 1871, p. 187; Boulenger Fauna British India . . ., 1890, p. 362.

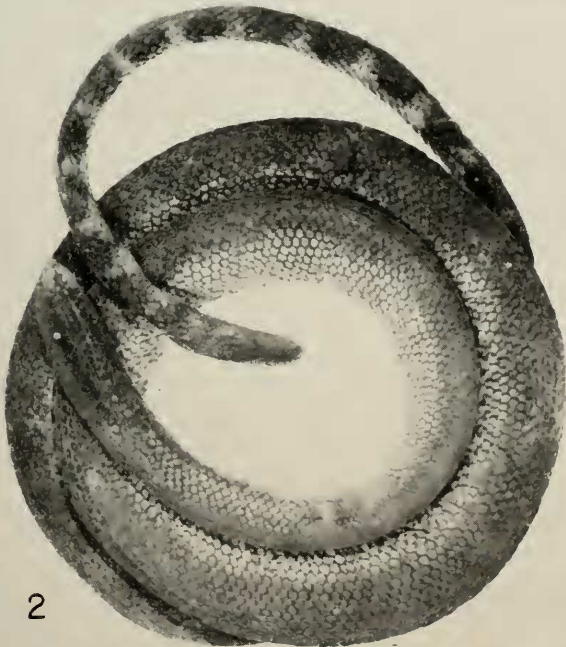
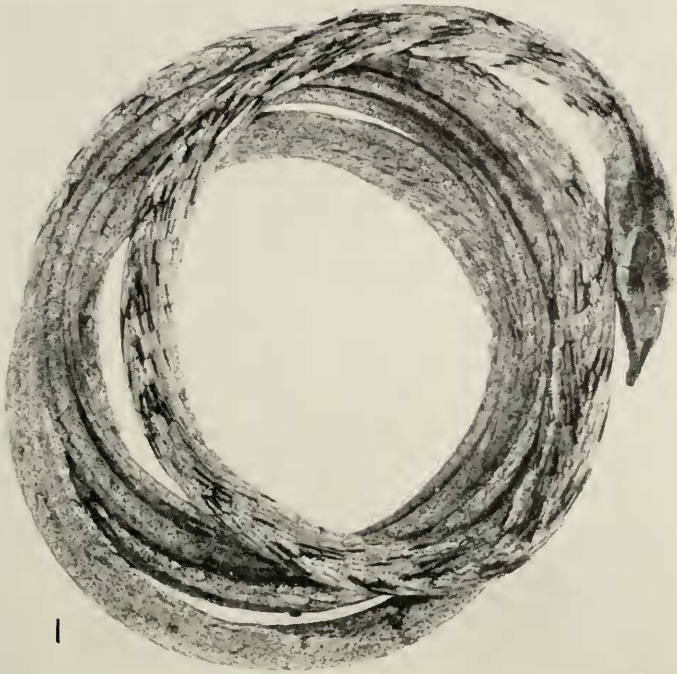
Boiga forsteni Wall, Ophidia Taprobatica or the Snakes of Ceylon, 1921, p. 285; Journ. Bombay Nat. Hist. Soc., 29, 1924, p. 874; Smith, Fauna of British India . . .; Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 358-359.

Dipsas forsteni var. *ceylonensis* Anderson, Proc. Zool. Soc. London, 1871, p. 187 (type locality, Ceylon).

Two specimens (EHT-HMS Nos. 30676, 30677) of this species were collected 12 miles north of Trincomalee, Ceylon. Both were obtained in the immediate vicinity of dwellings at night.

The color pattern of the larger specimen is complex. There is a series of dorsal light spots, and a second series alternating with these on the median lateral region. A third series is present still lower on the side which alternates with the second series. On the edges of the ventrals is a fourth series. Anteriorly, the spots of the four series are larger and often contiguous; posteriorly they are narrower and usually separated. Occupying the intervening spaces are areas or spots of brown, many scales of which are black-edged. These spots are usually contiguous. On the ventrals are series of

PLATE XXIII. Fig. 1. *Dryophis pulverulentus* Duméril, Bibron and Duméril. EHT-HMS No. 31245 ♂; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 1,322 mm. Fig. 2. *Microcephalophis gracilis* Shaw. EHT-HMS No. 30683 ♂; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 760 mm.



small dark spots. Two larger spots on the outer edges of the adjoining scales alternate with two or three spots on scales that are contiguous. The small spots are farther from the outer edges of the scales, and less distinct. A narrow light-edged stripe runs from the frontal to the nape. A broad brown stripe with a black edge runs from the eye to the angle of the jaw. All labials are edged with dark brown.

The scale counts for No. 30676 and No. 30677 are respectively: Ventrals 264, 257; subcaudals 111, 110; scale formula 39-27-29-17, 37-27-28-17; upper labials 9, 10.

GENUS DRYOPHIS Dalman

Dryophis Dalman, Analect. Entomol., 1823, p. 7 (substitute name for *Dryinus* Merrem [preoccupied]).

Genotype, *Coluber nasutus* Merrem.

Two forms, a brilliant green species and a dull brownish to grayish species, occur in Ceylon. They are probably equally numerous; however, the green form is more frequently taken probably due to its more conspicuous coloration.

KEY TO THE CEYLONESE SPECIES OF DRYOPHIS

1. Dermal appendage formed of rostral scale only. Green in color..... *nasutus*
 Ventral surface of the dermal appendage formed by rostral, the upper surface covered with small scales; color brownish or gray with some transverse black marks *pulverulentus*

Dryophis pulverulentus (Duméril, Bibron and Duméril)

Pl. XXIII, fig. 1

Dryinus pulverulentus Duméril, Bibron and Duméril, *Erpétologie Générale*, vol. 7, pt. 1, 1854, p. 812 (type locality not known).

Dryophis pulverulentus Boulenger, *The Fauna of British India* . . ., 1890, p. 371; Smith, *The Fauna of British India* . . ., *Reptilia and Amphibia*, vol. 3, *Serpentes*, 1943, p. 378.

Passerita purpurascens Günther, *Reptiles of British India*, p. 307, pl. 23, F (Ceylon).

This species is represented in the collection by five specimens, EHT-HMS Nos. 30731-30735, all from twelve miles north of Trincomalee, Ceylon.

Smith, *loc. cit.*, gives a lower average of ventrals and subcaudals for Ceylon specimens than for Indian specimens. His counts are, ventrals 179-193; subcaudals 151-178, Ceylon; ventrals 182-203; subcaudals 169-208 for south India.

The smooth scales are arranged in oblique transverse lines, the scale formula being 15-15-13, the median row being enlarged slightly. The dermal appendage on the tip of the snout is as long as the eye diameter.

The general color is brownish when the epidermis is intact or

grayish with epidermal scales removed. A series of more or less distinct darker crossbands are present, becoming indistinct posteriorly on body. These spots are formed by the darker edges of certain scales and the black intervening skin. There is a dark cephalic spot from the prefrontals to the back end of the parietals. An irregularly-edged dark stripe from the anterior end of the first labial to a point just behind the jaw angle. The ventral surfaces are powdered with brown or gray.

The following data gives certain scale variations for the species:

TABLE OF DATA ON *Dryophis pulverulentus*

Number	Sex	Ventrals	Sub-caudals	Pre-ocular	Post-oculars	Supra-labials	Infra-labials
30731	♂	183	173	3-3	2-2	8-8	9-9
30732	♀	181	161	3-3	2-2	8-8	10-10
30733	♂	178	165	3-3	2-2	8-8	9-9
30734	♂	183	179	3-3	2-2	8-8	9-9
30735	♂	188	175	3-3	2-2	8-8	9-9

Dryophis nasutus (Lacépède)

Coluber nasutus Lacépède, Histoire Naturelle des Serpents, vol. 1, p. 100, vol. 2, p. 277, pl. 4, fig. ? (type locality, Ceylon, Guinea, Carolina. Here restricted to Ceylon).

Dryophis mycterizans rhodonotus Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, p. 293 ("a beautiful rose-pink dorsally with pinkish-buff ventrally." Galatura Estate, Ceylon, 500-1,000 ft. high).

Dryophis nasutus Smith, The Fauna of British India . . . Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 376-378.

The specimens in the collection are U. S. N. M. Nos. 29428 "Ceylon", and 56419-56420 "Ceylon"; EHT-HMS Nos. 30714-30723, 12 to 15 miles north of Trincomalee, Ceylon. This series has representatives of several color varieties: yellow-green, grayish green, dark green, and lavender. All have the two cream lines on the ventrals and subcaudals, while only a few have also a median pair of white lines. In three cases these white lines continue to the vent; in the others they may be short or they may be absent, or at least not discernible.

GENUS HURRIA Daudin

Hurria Daudin, Bull. Soc. Philém. Paris, vol. 3, no. 72, Mar., 1803, p. 187.

Genotype, *Coluber cerberus*.

It seems that this name takes precedence over *Cerberus* Cuvier (1829 Reg. Anim.), which is used for this species by many herpetologists including Smith, *loc. cit.* See Stejneger, Herpetology of Japan, Bull. 58, 1907, U. S. N. M., p. 304, regarding the status of the two names.

A single species, *Hurria rhynchops* (Schneider), is recognized as occurring in Ceylon. It is widespread in southern and eastern Asia, Malay Archipelago and the Philippines.

Hurria rhynclops (Schneider)

Hydrus rhynclops Schneider, *Historia Amphibiorum naturalis et literaria*, vol. 1, 1799, p. 246.

Cerberus rhynclops Günther, *Reptiles of British India*, 1864, p. 279.

A specimen (EHT-HMS No. 30682) was captured in a salt water lagoon 13 miles north of Trincomalee, Ceylon. The color is lead with very indistinct darker banding; the ventrals are 147; anal divided; subcaudals 64. The scale formula is (40-27)-23-17. The keels are very strong on the scales, extending to the outermost row. (The outer row is not keeled in a Sumatran specimen at hand.) The labials are atypical in that only the first five are complete, the next five being divided transversely, leaving a series of very large "temporals" between the labials and the normal temporals. The frontal, like the parietals, is broken into a number of scales. The greater part of the three outer scale rows is somewhat pinkish white, forming a stripe, not visible from dorsal view, since three rows are largely on the ventral surface. The specimen has a single preocular (2 in the Sumatran specimen).

The species is a common one in river mouths and lagoons especially near mangrove associations. It also is reputed to enter fresh water.

FAMILY ELAPIDAE

There are three genera of the Elapidae represented in the island of Ceylon. They may be recognized by the following key applicable to Ceylon specimens. All are poisonous and among the more dangerous snakes.

KEY TO THE CEYLONESE GENERA OF THE ELAPIDAE

1. Maxillary bone not extending forward beyond the palatine; scales not oblique, the vertebral series strongly enlarged; neck lacking elongate ribs, and "hood," *Bungarus*
 Maxillary bone extending forward beyond the palatine; vertebral series not enlarged 2
2. Scales in 13-15 rows throughout the body; scales not oblique; neck not dilatable, *Callophis*
 Scales in 15-25 rows on body disposed obliquely; neck with elongate ribs, dilat-
 able, forming a "hood"..... *Naja*

GENUS BUNGARUS Daudin

Bungarus Daudin, *Mag. Encycl.*, vol. 5, Year 8 (= 1803), p. 434.

Genotype, *fasciatus*.

Two species occur in Ceylon.

KEY TO SPECIES OF BUNGARUS IN CEYLON

1. Lustrous black with a series of paired linear white marks crossing the body; lower parts white; ventrals, 195-225; subcaudals, 37-56..... *caeruleus*
 Black above with from 15 to 21 white crossbars, which are narrow on the vertebral line and widen laterally; may be indistinct in adult; belly white in young; banded black and white in adult; ventrals, 219-236; subcaudals, 32-42, *ceylonicus**

* This species was inadvertently omitted from the text. No specimens are at hand.

Bungarus caeruleus (Schneider)

Pseudoboa caerulea Schneider, *Historia Amphibiorum naturalis et literaria*, 1799-1801, p. 284 (Based on Russell's *An Account of Indian Serpents* . . . , vol. 1, p. 2, pl. 1) (type locality, Vizagapatam, India).

Bungarus caeruleus (part) Boulenger, *Fauna of British India* . . . , Reptilia and Batrachia, 1890, p. 388; Wall, *Ophidia Taprobanica or the Snakes of Ceylon*, 1921, pp. 437-451.

One specimen is at hand, KUMNH No. 24140, taken at Negombo, Western Province, Ceylon, by W. C. Osman-Hill.

The specimen is young, measuring 321 mm. in total length; the tail 36 mm.

The head is dark above, light on supralabials; a partial white band across back of head. The general color of body is gray-brown crossed by about 41 narrow transverse cream bands widening a little low on sides. At the anterior end of the body these are rather widely separated; at the fourth there is a pair of light lines separated by one or two scale rows that cross the body separating wider intervening dark blotches; farther back these white lines are farther apart until the white bands are separated by distances approximately equal to the intervening dark blotches. However they differ from the intervening bands in having the vertebral scales, or at least some part of the vertebrae, cream in color. The venter is uniformly white. The bands are obsolete on the tail. The ventrals are 208; the subcaudals 41, all single save one or two pairs near the extreme tip. The angle is single. The scale formula is 19(17)-15-15.

The head has been partially destroyed, presumably by ants, and all the characters cannot be determined.

GENUS CALLOPHIS Gray

Callophis Gray, *Illustrations of Indian Zoology*, vol. 2, 1834, pl. 86, fig. 1 (type *Callophis gracilis*).

Callophis Günther, *Proc. Zool. Soc. London*, 1859, p. 79.

Only a single species is known from Ceylon.

Callophis melanurus (Shaw)

Coluber melanurus Shaw, *General Zoology*, vol. 3, 1802, p. 552 (based on Russell's *Indian Serpents*, vol. 1, 1796, p. 12, pl. 8) (type locality, Nerva, Bengal); Smith, *Fauna of British India, Ceylon and Burma* . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, p. 420.

Callophis trimaculata Wall, *Ophidia Taprobanica or the Snakes of Ceylon*, 1921, pp. 497-501, fig. 90.

Two specimens of this rare snake were obtained by H. G. Diegman at Clodagh Estate, Rattota, Matale District, Ceylon (U. S. National Museum Nos. 120334, 120335. Wall reports 7 other specimens from the island.

Description: Rostral one third or more, wider than long, the part visible above about two thirds of the prefrontal suture; internasals

one third wider than long, their mutual suture less than half the prefrontal suture; prefrontals slightly longer than wide; frontal length four fifths of the distance from tip of snout; parietals very large, their length greater than their distance from the end of the snout, and twice as great as their width; anterior seminasal higher than wide, almost inclosing the nostril, much larger than posterior; preocular very large, longer than high; supraocular rather small, one half or less the area of the anterior temporal, which touches only the lower of two postoculars; six supralabials, the order of size being 1, 2, 4, 5, 3, 6, three scales touching the nasals, third and fourth entering orbit, fifth touching lower postocular, sixth as long as the temporal, but narrower; an enlarged secondary temporal also borders the parietal.

Diameter of eye a little less than its distance from the commissure of mouth. Mental very little narrower than rostral; anterior chinshields one fourth longer than posterior chinshields; six infralabials, first four touching the anterior chinshield, the fourth very large; posterior chinshields separated from the first ventral by four scales.

Thirteen scale rows from head to anus; seven or eight about base of tail. Ventrals 231, the first divided; 28 divided subcaudals; anal divided; no apical pits; under magnification scales appear finely striated. Maxillary with a single fang, but no other teeth apparent.

Coloration. Above generally gray-brown with 19 transverse bands of black on the dorsum, these sometimes complete, sometimes broken mesially and the opposite half occasionally displaced. The spot on neck somewhat heavier than others; two black bands encircle the tail; the ventral surface bluish gray with six small black spots arranged more or less symmetrically; venter, fawn on under side of neck, gradually becoming darker salmon orange to pinkish on later fifth of body; outer one or two scale rows somewhat fawn, merging into dorsal and ventral color.

Top of head nearly uniform brownish. A diffuse blackish spot about eye, extending along lower part of labials to a blackish spot near angle of mouth but enclosing a roundish cream spot which covers parts of three scales, but is chiefly on the anterior temporal; this followed by a lateral cream area extending from throat; nuchal dark band curving back is more or less connected with dark area at angle of mouth. Occasional dark flecks, usually confined to median row or third outer row.

A young specimen, U. S. N. M. No. 120334, from the same local-

ity agrees in almost all details of squamation. The posterior chin-shields are proportionally larger, nearly equalling the size of the anterior. There are 223 ventrals, and 37 subcaudals. There are 16 dorsal transverse body spots (some broken) with two on tail, both of which are interrupted ventrally. The colors are faded. The spotting on the third outer scale row is a little more regular and there are more of the scattered dark flecks. The small subcaudal spots are not evident. The flecks on the dorsal scales tend to form lines. The head is a very light brown with only minute flecks. The eye spot and the spot at the angle of the mouth are very diffuse, scarcely discernible without a lens. The neck band is black.

There are certain obvious differences between the specimens here described and descriptions given of Indian specimens. Thus there are marked differences in head coloration, the type and others are described as having a black head and neck; with a pair of yellow spots on the occiput. The Ceylon adult loses the series of lines on the back and they are scarcely evident in the young; Smith states that the under part of the tail is red, while Wall, perhaps speaking of Ceylon forms mentions the color as pearly gray or pale bluish. The Indian species is regarded as small (about a foot long). The larger of these two specimens is approximately 437 mm. (approximately 17½ inches) suggesting that it is a larger form than the Indian species. Moreover there is a smaller number of ventrals (when sexes are compared) in the island specimens. While I believe the Ceylonese form worthy of subspecific designation, material as yet is too scanty to delimit the form.

GENUS NAJA Laurenti

Naja Laurenti. Specimen medicum exhibens Synopsis Reptilium emendatum, 1768, p. 90.
Genotype: *Coluber naja* Linnaeus.

Naja naja naja (Linnaeus)

Pl. XXIV, fig. 2

Coluber naja Linnaeus, Systema Naturae, 10th ed., 1758, p. 221. (Based on Seba, Thesaurus, vol. 1, 1734, pls. 44, 85, 89, 90, 97 [part.]) (type locality, India).

Naja naja polyocellata Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 21, 1939, p. 233 (type locality, Polonnaruwa, N. Central Province, Ceylon).

Naja naja naja Smith, The Fauna of British India . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 428, 431; Deraniyagala, Spolia Zeylanica, vol. 24, pt. 2, 1945, p. 109.

Deraniyagala (*loc. cit.*) has limited the distribution of the subspecies *Naja naja naja* to the island of Ceylon, and has applied names to certain Indian forms. While it is almost certain that there are forms worthy of names occurring on the continent, Deraniyagala suggests that since he has not been able to consult the "various rare

old publications containing the different descriptions of *Naja*" some of the names may not be correctly applied by him. In view of the possibility that the name *lutescens*, which he applied to a peninsular race, may be applicable to a northern race, he suggests an alternative name, *Naja naja madrasiensis* for the same. Smith, *loc. cit.*, regards *Naja naja naja* as extending throughout much of peninsular India.

The chief structural character offered by Deraniyagala in separation of the Ceylon forms seems to be in the position of the opening of the poison groove. In *N. n. naja* it is well above the apex, in the nearest continental form the outlet is said to open at the apex. The markings differ in details.

There are four specimens in the collections from Ceylon: U.S.N.M. No. 120333, Peradeniya, Kandy District, Ceylon; EHT-HMS Nos. 30702-30704, 12 miles north of Trincomalee, Ceylon.

All are the typical "spectacled" cobras. They vary somewhat in the number and distinctness of the black bars across the venter, which may or may not be traceable across the dorsum and the markings vary with age. The scale characters of the four specimens are recorded in the following table.

TABLE OF DATA ON CEYLONESE SPECIMENS OF *Naja naja naja*

Number	Sex	Ventrals	Sub-caudals	Supra-labials	Infra-labials	Scale rows
30702	♂	185	57	7-7	9-9	35, 23, 23, 15
30703	♀	187	59	7-7	8-8	35, 23, 23, 15
30704	♀	192	60	7-7	8-8	35, 23, 23, 15
120333	♀	188	60	7-7	8-8	33, 23, 23, 15

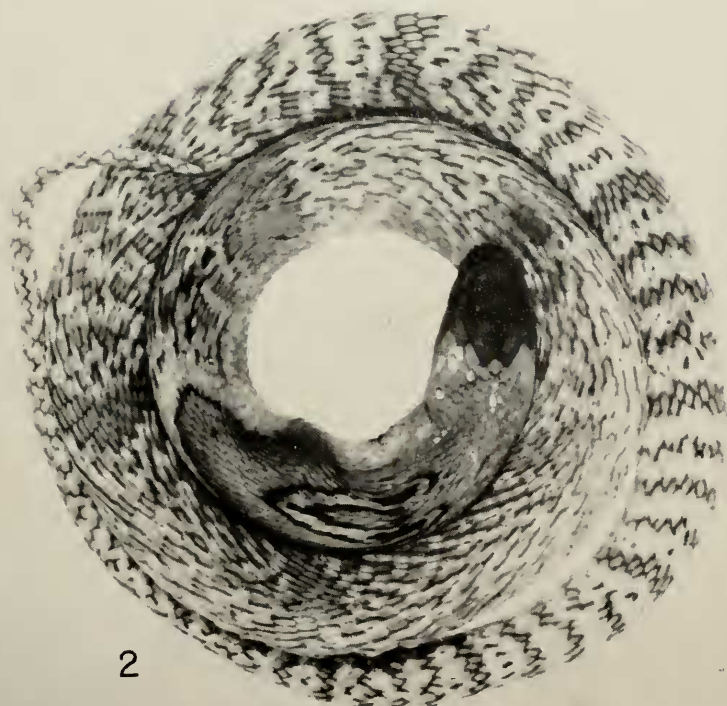
Three first labials touch the posterior nasal; the temporals are 2-3 (in one specimen a small scale makes a count of 2-4). In No. 30702 there is a very small triangular labial between the fourth and fifth labials. It presumably is a segmented portion from the fourth.

The number of black marks across the venter can be determined with difficulty in older specimens. They vary in width; the first and third or first, second and third being usually widest.

FAMILY HYDROPHIIDAE

Ceylon has known representatives of several genera of the sea snakes, and it is probable that others, not yet reported also occur. Wall, in his *Ophidia Taprobanica*, has listed 22 species under 16

PLATE XXIV. Fig. 1. *Agkistrodon hypnale* (Merrem). EHT-HMS No. 30691 ♀; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 354 mm. Fig. 2. *Naja naja naja* (Linnaeus). EHT-HMS No. 30702 ♂; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 936 mm.



genera. I have found authentic records of only the following genera: *Kerilia*, *Hydrophis*, *Lapemis*, *Astrotia*, *Pelamis* and *Microcephalophis*.

These may be distinguished by the following key.

KEY TO CEYLONESE GENERA OF THE FAMILY HYDROPHIDÆ

1. Ventrals distinct throughout length, normally entire, not divided..... 2
 Ventrals, except near anterior part of venter, either divided medially by a longitudinal fissure or vestigial (smaller than adjacent scales or absent)..... 3
2. Scales normal, imbricating, not more than 23 rows around the body, not quadrangular or juxtaposed..... *Kerilia*
 Scales tending to be quadrangular, or hexagonal, juxtaposed, not or scarcely imbricating; more than 25 scales around body..... *Hydrophis*
3. Head very small, the greatest diameter of body four or five times that of the neck; the neck and anterior third or two fifths of body very slender, posterior part compressed and deepened..... *Microcephalophis*
 Head not especially small, the diameter of the neck one third or less that of the greatest body diameter..... 4
4. Dorsal scales pointed strongly imbricate; ventrals divided into two halves; large species, of large girth..... *Astrotia*
 Dorsal scales juxtaposed, subquadrangular in shape..... 5
5. Ventrals when distinct with a longitudinal fissure; dorsal coloration nearly uniform; lateral and ventral coloration lighter (whitish yellow) with or without a longitudinal darker or lighter lateral line; lower scale rows not larger than others, *Pelamis*
 Ventrals when present more or less divided; lower three or four rows of lateral body scales larger than others..... *Lapemis*

GENUS KERILIA Gray

Kerilia Gray, Catalogue of the Snakes in the British Museum, 1849, p. 57.

Genotype, *Kerilia jerdoni*.

Only a single species known.

Kerilia jerdoni jerdoni Gray

Kerilia jerdoni Gray, Catalogue of the Snakes in the British Museum, 1849, p. 57 (type locality, Madras); Smith, The Fauna of British India . . . Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 446-447, fig. 143.

There is no specimen present in the collection.

This species of sea snake may be diagnosed by the following characters: large imbricating scales; head shields of the normal number except loreal absent; scales in 19-23 rows; one preocular, one postocular; ventrals narrow; six supralabials, anterior temporal, one; ventrals 225-253. Body of equal diameter throughout. Dark bands encircle the body in the young and may be retained in adults.

GENUS HYDROPHIS Latreille

Hydrophis Latreille, Histoire Naturelle des Reptiles, vol. 4, 1802.

Genotype, *fasciatus*.

Only three of the numerous species of this genus have been reported in Ceylon. These are *cyanocinctus*, *bituberculatus* and *lapemoides*.

These three forms may be distinguished by the following synopsis.

KEY TO CEYLONESE SPECIES OF HYDROPHIS

1. Scales on the deepest part of the body with rounded or indistinctly pointed tips, distinctly or feebly imbricate; 5-8 solid maxillary teeth behind the fangs; body elongate 2
Scales on thickest part of body subquadrangular or hexagonal in shape, juxtaposed, nonimbricate; 8 to 18 maxillary teeth behind fangs; two anterior temporals; 29-35 scale rows on the neck; ventrals, 314-372; head with a curved yellow mark in young, lost or indistinct in adults..... *lapemoides*
2. One anterior temporal; body uniform gray 7 or 8 solid maxillary teeth behind fangs; greatest diameter of head four times that of neck; scales, 27-48; ventrals, 276 *bituberculatus*
Two anterior temporals; body banded with annuli; 5 or 6 solid maxillary teeth behind fangs; diameter of head at most two and one-half times that of neck, *cyanocinctus*

Hydrophis cyanocinctus Daudin

Hydrophis cyanocinctus Daudin, Histoire Naturelle des Reptiles, vol. 7, 1803, p. 383 (Based on Russe's An Account of Indian Serpents, vol. 2, p. 10, pl. 9) (Sandarbans).

See characters in Key. No specimens in the collection.

Hydrophis bituberculatus Peters

Hydrophis bituberculatus Peters, Monatsb. Akad. Wiss. Berlin, 1872, p. 855 (type locality, Colombo, Ceylon).

No specimens in the collection. The species is known from a single specimen.

Hydrophis lapemoides (Gray)

Atira lapemoides Gray, Catalogue of the Specimens of Snakes in the Collection of the British Museum, 1849, p. 46 (type locality, Ceylon, Madras. Here restricted to Ceylon).

Hydrophis lapemoides Smith, Monograph of the Sea Snakes, 1926, p. 86.

No specimens in the collection.

GENUS MICROCEPHALOPHIS LESSON

Microcephalophis Lesson, In Belanger, Voy. Ind. Orient, 1834, p. 320.
Genotype, *gracilis*.

Of the two species recognized, only one has been recorded from Ceylon.

KEY TO THE SPECIES OF MICROCEPHALOPHIS

- Prefrontal not touching the third supralabial; ventrals, 220-350..... *gracilis*
Prefrontal touching the third supralabial; ventrals, 404-468 *cantoris*

Microcephalophis gracilis gracilis (Shaw)

Pl. XXIII, fig. 2

Hydrus gracilis Shaw, General Zoology, vol. 3, 1802, p. 560.

Microcephalophis gracilis Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 325-330, fig. 62; Smith, Monograph of the Sea-snakes (Hydrophiidae), Nov. 27, 1926, pp. 121-213, fig. 34, skull; and Fauna British India including Ceylon and Burma, etc.: Reptiles and Amphibia, vol. 3, Serpentes, pp. 325-330, fig. 62, A-D.

I collected this species from the beach 12 miles north of Trincomalee, Ceylon (EHT-HMS No. 30083). The specimen was very active

but wholly unable to make any progression on the wet sand. It had been stranded by a small wave, and when found was less than four feet from the edge of the water.

This species is regarded as rare throughout most of the wide area where it occurs. Smith (Monograph) reports a Ceylon specimen, and Wall (*loc. cit.*) mentions four specimens in the Colombo Museum, presumably from Ceylon. He reports it as common on the Malabar and Coromandel Coasts of India, and gives its range as extending from the Persian Gulf to Japan. An Australian record needs further confirmation since it has not been recorded in the intervening territory. The other species of the genus (*M. cantoris*) is unknown as yet in Ceylonese waters.

The arrangement of head scales conforms to Wall's figure save that the rostral is higher and the width of the rostral one third greater. The ventral count is 233, the subcaudals 38. The latter part of the body is extremely compressed, the dorsal part forming a sharp crest. The anterior narrowed part however is nearly cylindrical. The depth of the head at the mouth angle (5.3 mm.) is contained in the greatest body depth (22 mm.) about four times. There are 31 scales around the neck (33 counting the divided ventrals), and 29 a centimeter in front of the anus.

Several small barnacles are fastened to the scales of the specimen.

Smith has recognized a subspecies of *gracilis* on the coast of the Malayan Peninsula and Java.

GENUS *ASTROTIA* Fischer

Astrotia Fischer, Abh. Naturw. Ver. Hamburg, vol. 3, 1856, p. 38.

Genotype, *schizopholis* = *stokesi*.

Only a single species known.

Astrotia stokesii (Gray)

Hydrus stokesii Gray, In Stokes' Discovery of Australia, vol. 1, p. 502, pl. 3.

Astrotia stokesii Wall, Mem. Asiat. Soc. Bengal, vol. 2, 1909, p. 250; Ophidia Taprobanica . . . , 1921, p. 396; Smith, The Fauna of British India . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 471-472.

This, the largest of the sea serpents, is known from the western coast of Ceylon. No specimens are in the collection.

This form may be recognized by the character of the ventral scales. These are divided in two, except anteriorly, and the halves are pointed or with a dentate tip. The ventrals are 226-286, the preanals strongly enlarged. The diameter of the neck is more than half the greatest body diameter. One preocular and two postoculars are present. The supralabials are 8-10, the infralabials 10-12. The

scale rows vary between 37 and 47 on the neck, and 47-59 on the body.

The color is "yellowish or pale brown, with broad black or dark brown bands more or less complete, or with dorsal bars and ventral spots. Spots or narrow bars often present between the annuli. Head dark olivaceous to yellowish."

The species reaches a length of at least 1600 mm. and the girth of a large specimen may exceed 260 mm.

GENUS PELAMIS Daudin

Pelamis (in part) Daudin, Histoire Naturelle, Générale et Particulière des Reptiles (1803), Year XI, vol. VII, pp. 357, 361, 362.

Genotype, *Anguis platurus*.

Only one species is generally recognized. It is one of the most widely distributed of all snakes. There are a number of so-called color varieties.

Pelamis platurus (Linné)

Anguis platurus Linné, Systema Naturae, ed 12, 1766, p. 391.

Pelamis platurus Gray, Ann. Philos., 1825, p. 15; Smith, Monograph of the Sea-snakes (Hydrophiidae), Nov. 27, 1926, pp. 116-120, fig. 33; Smith and Taylor, U. S. Nat. Mus. Bull., No. 187, 1945, pp. 176-177.

The puzzling variety of color patterns and the remarkable variation in scale rows and ventral scale counts suggest strongly that the assemblage of forms now placed under this specific designation represents more than a single species. The scale rows reputedly vary from 49-67 rows, a difference of 18 rows. The ventral scales vary between 264-406, a difference of 142. Few if any other snakes have scale variations of this magnitude.

Specimens are at hand from Ceylon belonging to two or three well-marked color forms.

U. S. Nat. Mus. No. 19213 is a specimen in which the body is blackish above (faded), and yellowish below, the black beginning on the head in the region of the nostrils and extending along the dorsum in a band 11 scale rows in width, for about one third the length of the body. Where this ends, there begins a series of transverse bands, contiguous mesially and extending down on the sides. Posteriorly the dorsal parts are separated. There are no lateral spots save on the tail where small spots intervene on the sides between the bands.

U. S. Nat. Mus. No. 31212 has the black coloration forming a series of spots contiguous on the median dorsal line. Posteriorly the spots are rhomboidal, extending rarely half way down the side. The intercalated spots may be distinguished by their being lower on the

sides of the tail. This specimen, although a shorter specimen than the preceding one, has the nostrils distinctly farther back from the tip of the snout.

A third specimen from the northeast coast, 12 miles north of Trincomalee, is coal-black on the dorsal 25 scale rows, and dirty, grayish lavender on the ventral part of the body save for an indistinct lighter line separating the two colors. The labials are not lighter than the ventral coloration. The tail is clear pinkish white with a series of transverse coal-black bands, contiguous or not, dorsally, and a series of black spots alternating with them on each side. In front of and behind the vent there is a deep black spot.

The ventral-subcaudal scale counts for Nos. 31213, 31212 and 31250 are, respectively, 334-44, 369-52, 360-55; and the midbody scale rows are, respectively, 58, 51, 58. The four preanals in No. 31212 are reduced to the size of other ventral scales and the scales preceding these are not enlarged.

Thus if one considers these variant forms as worthy of names, they must be regarded as species rather than subspecies.

GENUS LAPEMIS Gray

Lapemis Gray, Illustrations of Indian Zoology, chiefly selected from the collection of Major-General Hardwicke, vol. 2, 1835, pl. 87, fig. 2.

Genotype, *Lapemis curtus* Shaw.

Two species are known.

Lapemis curtus Shaw

Lapemis curtus Shaw, General Zoology, vol. 3, 1802, p. 562 (type locality not given).

A single specimen, EHT-HMS No. 30678 ♀, was taken on the shore of the Bay of Bengal, 13 miles north of Trincomalee. The following scale characters obtain: frontal shorter than its distance from rostral; parietal broken into three or four unequal scales; one preocular, one postocular; seven supralabials, the two last very small; second supralabial bordering the prefrontal; fourth only bordering orbit; two large anterior temporals, two posterior temporals; three infralabials border the chinshields; both pairs of chinshields separated by one or two scales.

The scale rows counted at various points on body are 35-37-30-40-33; scales more or less quadrangular, juxtaposed; ventrals 195, more or less distinct throughout; subcaudals 45 (scales in a row on lower edge of tail).

Head normal, the body greatly thickened and laterally compressed; at its greatest depth approximately three times depth of

neck; back with a moderately sharp ridge; gray with 58 bands across the back separated by one or two scales on the median dorsal line and coming to a point low on side; below these and on venter yellowish buff.

FAMILY VIPERIDAE

The family consists of two subfamilies, Viperinae and Crotalinae.

SUBFAMILY VIPERINAE

This subfamily is represented in Ceylon by two genera, *Echis* and *Vipera*, each represented by a single species.

GENUS VIPERA Laurenti

Vipera Laurenti (part), Specimen medicum, exhibens Synopsin Reptilium emendatum, 1768, p. 99.

Genotype, *redii* = *aspis*.

Vipera russelli russelli (Shaw)

Coluber russelli Shaw, Naturalists Miscellany vol. 8, pl. 291 (1797) (type locality, India, by inference).

Vipera russelli Strauch, Mem. Acad. St. Petersburg, 7, XIV, No. 6, p. 85; Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, p. 504.

Vipera russelli russelli Smith, The Fauna of British India . . . , Reptilia and Amphibia, vol. 3, Serpentes, 1943, p. 483.

Two specimens (U. S. Nat. Mus. No. 115611 and EHT-HMS No. 30679) are at hand, the latter taken 12 miles north of Trincomalee, Ceylon. I have the skin of a fine specimen (EHT-HMS No. 31254) presented to me by Major General Richardson. It was killed by him in his yard in Trincomalee.

This snake is not rare in this part of Ceylon. Several dead specimens were seen along the road.

The species is not aggressive. Usually, when disturbed, it hisses rather loudly.

GENUS ECHIS Merrem

Echis Merrem (part.), Tentamen Systematis Amphibiorum, 1820, p. 49.

Genotype, *Echis carinata*.

Echis carinatus Schneider

Pseudoboa carinata Schneider, Historia Amphibiorum naturalis et literaria, vol. 2, 1801, p. 285 (species based on Russel, An Account of Indiana Serpents . . .)

Echis carinata Fayerer, The Titanophidia of India . . . , 1874, pl. 12; Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 529-547, figs. 93-95.

No Ceylonese specimens of this species are in the collection. I have taken it in the city of Bombay.

In Ceylon the species is known only from the extreme northern part and may be of relatively recent introduction. It is a small

snake that has the habit of producing a curious rasping sound. The scales have a sawlike crest or keel which when rubbed together produce the sound.

SUBFAMILY CROTALINAE

This subfamily is represented by two genera, *Agkistrodon* and *Trimeresurus* the first with two, the second with one species.

GENUS TRIMERESURUS Lacépède

Trimeresurus Lacépède, Ann. du Mus. Paris, vol. 4, 1804, pp. 196, 209 (part).
Genotype, *Trimeresurus virid's*.

This genus name as applied to Asiatic forms, is, I believe, composite, as is the name *Bothrops* as applied to related groups of pit vipers in Mexico, Central and South America.

Only a single species is known from Ceylon.

Trimeresurus trigonocephalus (Sonnini and Latreille)

Vipera trigonocephala, Sonnini and Latreille, Histoire Naturelle des Reptiles, vol. 3, 1801 (1803?), p. 175 (type based on Seba, Thesaurus, vol. 2, pl. 36, No. 2 [said to be from the Island of St. Eustace]); Daudin, Histoire Naturelle Générale et Particulière des Reptiles, vol. 6, year XI (1803), pp. 175-177.

Cophias trigonocephalus Mörsem, Tentamen Systematis Amphibiorum, 1820, p. 156.

Megaera trigonocephala Wagler, Natürliches System der Amphibien, 1830, p. 174; Gray, Zoological Miscellany, 1842, p. 49; Kelaart Prodrum Faunae Zeylanicae, being Contributions to the Zoology of Ceylon, vol. 1, 1853, p. 142; and *idem*, vol. 2, pt. 7, 1854, p. 8 (*trigonocephala*).

Trigonocephalus nigro-marginatus Kuhl, Beiträge Zool., 1832 (1820), p. 90; Schlegel, Essai sur la Physiologie des Serpens, 1837.

Bothrops nigro-marginatus Duméril, Bibron and Duméril, Erpétologie Générale, vol. 7, pt. 2, pp. 1515-1517.

Megaera olivacea Gray, Zoological Miscellany, 1842, p. 12 (type locality not known); and Catalogue of the specimens of Snakes in the collection of the British Museum, 1849, p. 12.

Trimeresurus trigonocephalus Günther, Reptiles of British India, 1864, p. 390; Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, p. 223; Boulenger, The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 431; Werner, Abh. Vehr. Zool. Bot. Ges. Wien, vol. 43, 1893, p. 352; and Sitzb. Vehr. Zool. Bot. Ges. Wien, vol. 46, 1896, p. 10; Abercromby, The Snakes of Ceylon, 1910, pp. 49, 69; and Spoilia Zeylanica, vol. 7, 1911, p. 207; *idem ibid.*, p. 304; Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 560-564, fig. 98 (head); Journ. Bombay Nat. Hist. Soc., vol. 30, 1925, p. 249; and Poisonous Snakes of India, 1928, p. 50; Smith, The Fauna of British India including the whole of the Indo-Chinese subregion; Reptilia and Amphibia, vol. 3, Serpentes Dec., 1943, pp. 506-507.

Lachesis trigonocephalus Boulenger, Catalogue of the Snakes in the British Museum (Natural History), vol. 3, 1896, p. 559; Pearless, Spoilia Zeylanica, 1909, p. 54 (Badula).

One specimen (No. 5894) is present in the U. S. National Museum Collection.

Scale rows are 26-21-19-15; supralabials 10-11; infralabials 12; one or two pairs of suboculars separate the labials from the eye; ventrals 147, the terminal ventral divided forming two scales deeply notched between; anal single; subcaudals, 58, double. The supra-ocular is divided, and separated from those of the opposite side by five irregular scale rows.

The skin is dark, approaching coal black near the dorsal surface. Most of the scales are some shade of green with black areas with elongate extensions. This series of markings may be more or less connected. Upper part of head greenish, the scales often partially black-edged. A broad black stripe present from eye to mouth angle. The supralabials are yellow, with a dark line crossing below eye; the ventrals are yellowish or greenish, edged with yellowish. The under side of head is yellowish. The tail is black at the tip.

GENUS AGKISTRODON Beauvois

Agkistrodon Beauvois, Trans. American Phil. Soc., vol. 4, 1799, p. 381.

Genotype, *Agkistrodon mokasen*.

Two forms of this genus are recognized in Ceylon. These may be differentiated by the following key.

KEY TO CEYLON SPECIES OF AGKISTRODON

- A. Hump on snout tip occupies only the middle of the tip; ventrals, 120-135; subcaudals, 28-30; 380 mm. in total length..... *nepa*
 B. Hump on snout tip occupies the whole of the tip; ventrals, 138-157; subcaudals, 32-46; 545 mm. in total length..... *hypnale*

Agkistrodon nepa (Laurenti)

Coluber nepa Laurenti, Specimen medicum, exhibens Synopsin Reptilium emendatum, 1768, p. 97 (based on Seba, vol. 1, pl. 19, fig. 7) (type locality, erroneously "Madagascar").

Hypnale nepa Günther, Reptiles of British India, 1864, p. 394 (*part.*).

Ancistrodon nepa Smith, Journ. Bombay Nat. Hist. Soc., vol. 39, 1937, p. 730; and Fauna of British India, Ceylon and Burma including the whole of the Indo-Chinese subregion: Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 500-501, Ceylon (Hagkalla, Kandy, Ambewela, Mudulkale).

Ancistrodon hypnale Boulenger, The Fauna of British India including Ceylon and Burma, 1890, p. 424 (*part.*).

Ancistrodon millardi Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, p. 554, fig. (not *millardi*, Wall, 1908); Journ. Bombay Nat. Hist. Soc., vol. 30, 1925, p. 249.

I have examined two specimens, KUMNH Nos. 24142, 24143 (which lack exact locality data). These have the following scale counts respectively: Ventrals 140-139; subcaudals 42-36; anal single in both. The scale formula in each is 17-17-15.

The rostral is strongly elevated, at least two fifths extending above the surface of the snout. The posterior side of the elevation is covered with some 15 small scales. The area in front of the frontal is occupied by 16 imbricating scales. The frontal, supraoculars, and parietals are normally large and unbroken. The supralabials are 7-7; the infralabials 8, 8, with only three touching first chin-shields. The color above is brown or fawn with indistinct darker marks on each side that sometimes are fused on the middorsal line. The venter is thickly peppered with dark pigment.

Agkistrodon hypnale Merrem

Pl. XXIV, fig. 1; Pl. XXV

Cophias hypnale Merrem, Tentâmen Systematis Amphibiorum, 1820, p. 155.*Trigonocephalus hypnale* Schlegel, Essai sur le Physionomie des Serpens, 1837, p. 550, pl. 20, fig. (type locality, "Ceylon").*Trimeresurus ? ceylonensis* Gray, 1842, Zoological Miscellany, 1842, p. 49 (Ceylon).*Hypnale nepa* Günther, Reptiles of British India, 1864, p. 394 (part).*Hypnale affinis* Anderson, Journ. Asiatic Soc. Bengal, 40, pt. 2, 1871, p. 20 (Ceylon).*Ancistrodon hypnale* (part) Boulenger, The Fauna of British India including Ceylon and Burma: Reptilia and Batrachia, 1890, pp. 424-425; Catalogue of the Snakes in the British Museum of Natural History, 2d ed., vol. 3, 1896, p. 76; Wall, Spolia Zeylanica, vol. 3, pt. 10, Oct., 1905, pp. 146-147; *ibid.*, vol. 11, 1920, p. 403; *ibid.*, vol. 12, 1924, p. 270; Journ. Bombay Nat. Hist. Soc., vol. 30, 1925, p. 248; Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 549-554, fig. 96 (head); Peerless, Spolia Zeylanica, vol. 6, pt. 21, Mar., 1909, p. 55; Abercromby, *ibid.*, vol. 8, pt. 32, 1913, pp. 304-305 [It is possible some of the references of Wall, Peerless and Abercromby may refer to *A. nepa*]; Smith, The Fauna of British India, Ceylon and Burma including the whole of the Indo-Chinese subregion; Reptilia and Amphibia, vol. 3, Serpentes, 1943, pp. 499-500.

The adult males and females differ considerably in color, that of the female being very much lighter in shade, with the dark markings usually more intense and more strongly contrasting.

The general dorsal coloration is lavender-brown with dim or well-defined brown or blackish markings. The light areas on the back tend to separate the dark spots. A dark line, more or less distinct runs from the eye to the angle of the mouth, where it may continue back along the edge of the ventrals for some distance as a narrow black line, continuous or more usually broken. A white or cream line usually borders the upper edge of the dark line on the head and this may follow along the anterior edge of the ventrals as a series of broken irregular white flecks. On the outer scale row alternating scales usually have small black dots.

Variation in scale counts are recorded in the accompanying table.

Specimen No. 30753 contained 9 embryos. These were well advanced and scale counts were made on the lot. The ventrals and subcaudals are: 146-38, 148-36, 149-36, 150-39, 152-38, 150-36, 151-38, 149-42, and 149-44. The last two are male specimens and have the hemipenis extruded. The others are presumably females. Thus the range for the brood is 146-152 for ventrals; 36-44 for subcaudals. A single male specimen in the United States National Museum from an unknown Ceylon locality has 151 ventrals and 44 subcaudals.

In the species the anal scales are invariably undivided, and there are three preoculars, one subocular and one postocular.

The species was found to be the most common terrestrial snake in the region about Trincomalee. Specimens were discovered encoiled under logs, under small piles of trash, or crawling about

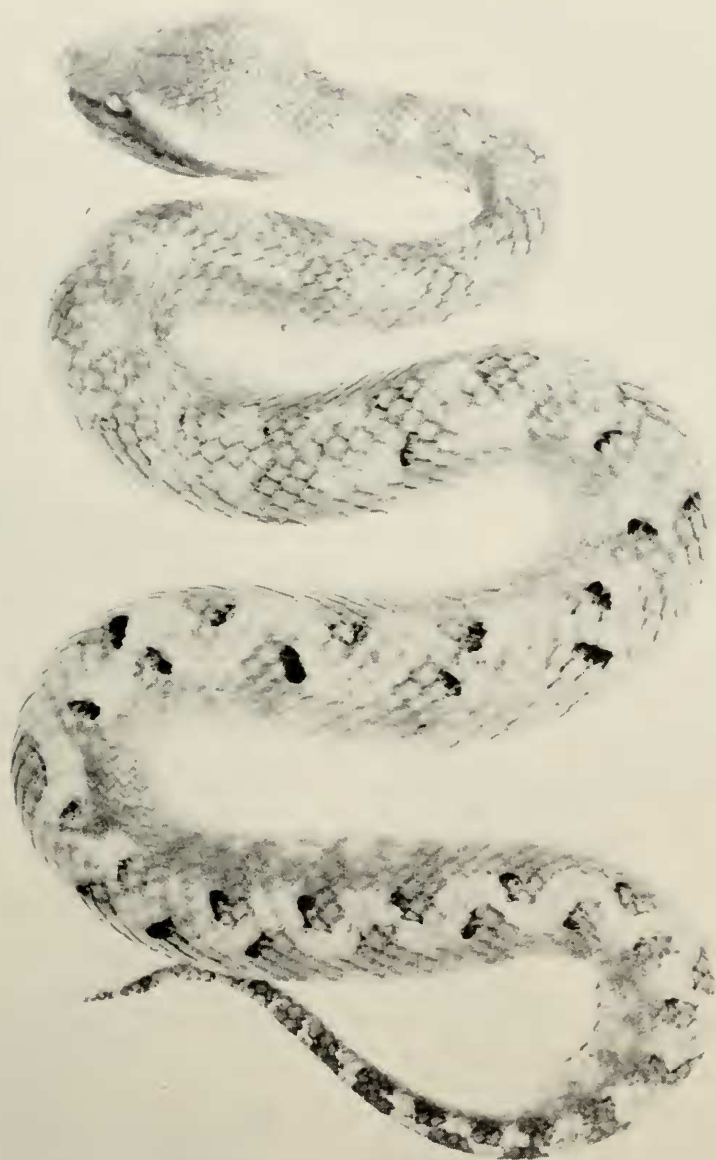


PLATE XXV. *Agkistrodon hypnale* (Merrem). EHT-HMS No. 30687 ♀; 12 miles north of Trincomalee, Eastern Province, Ceylon; total length, 434 mm.

during the day or night on the forest floor. They were slow to anger and only struck when teased or injured. It is not regarded as a dangerous snake by the natives.

SCALE COUNTS OF *Agkistrodon hypnale*

EHT-HMS No.	Sex	Ventrals	Caudals	Scale formula	Upper labials	Lower labials	Pre- ocular
30684	♀	153	38	20-17-15	7-7	9-9	3-3
30685	♀	147	36	19-17-15	7-7	9-9	3-3
30686	♂	154	46	19-17-15	7-7	8-8	3-3
30687	♂	154	44	19-17-14	7-7	9-8	3-3
30688	yg.	153	37	19-17-15	7-7	9-9	3-3
30689	♀	150	39	19-17-15	7-7	9-9	3-3
30690	♀	153	38	19-17-15	7-7	9-9	3-3
30691	♀	152	38	19-17-15	7-7	9-9	3-3
30692	♀	156	38	19-17-15	...	...	3-3
30693	♂	149	41	19-17-15	7-7	9-9	3-3
30694	♂	153	45	19-17-15	...	...	3-3
30695	♀	153	38	17-17-15	7-7	9-9	3-3
30750	♀	150	37	17-17-15	7-7	9-9	3-3
30751	♂	152	45	19-17-15	7-7	8-8	3-3
30752	yg.	153	37	19-17-15	8-8	9-9	3-3
30753	♀	146	38	19-17-15	7-7	9-9	3-3
30754	♀	153	37	19-17-15	7-7	7-9	3-3
30755	♂	154	45	19-17-15	7-7	9-9	3-3

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